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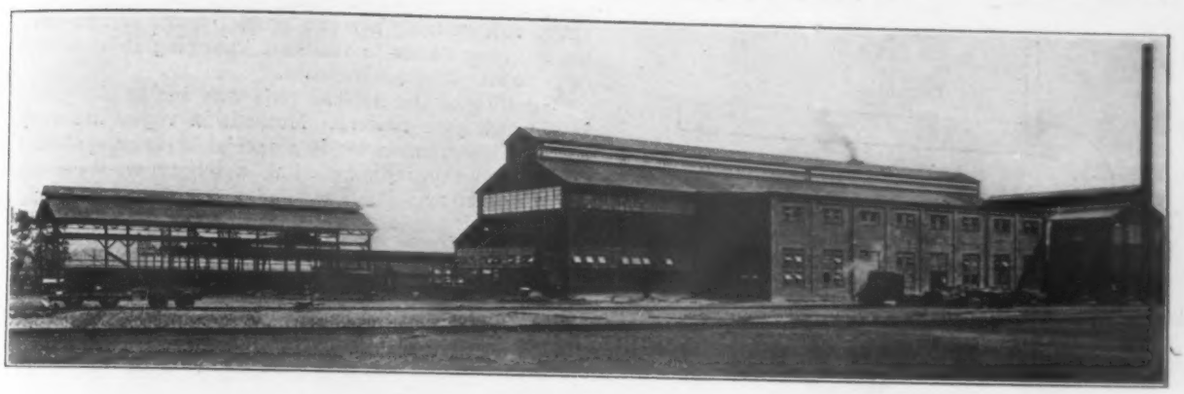


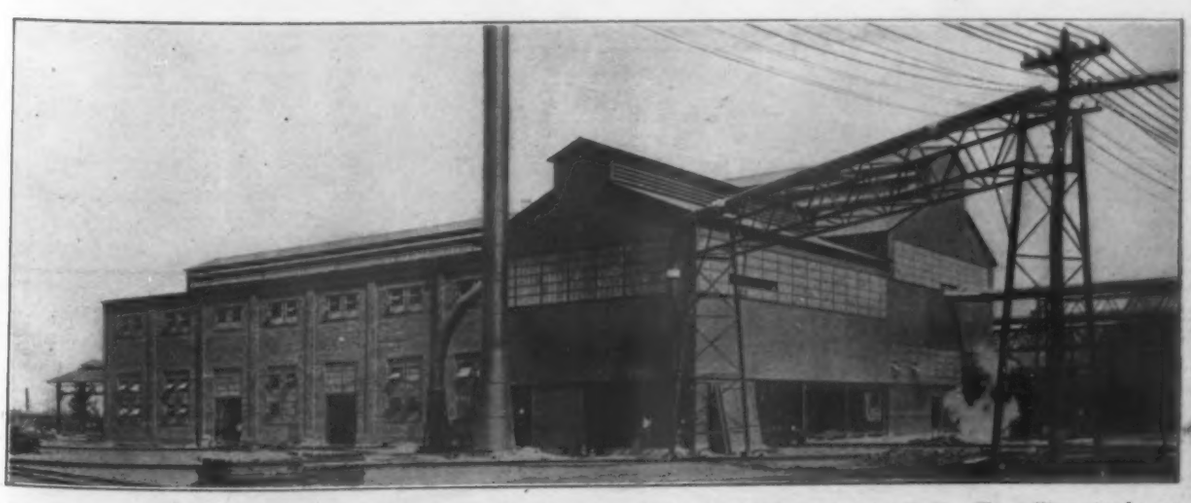
New Rod Mill for Wire and Cable Plant

Tonnage Unit of Combined Continuous and Looping Type Installed for Rolling Both Steel and Copper

SEVERAL causes have cooperated in expanding at the Kinkora plant at Roebling, N. J., 11 miles down the Delaware River from the main plant of the John A. Roebling's Sons Co. at Trenton, the equipment for turning out tonnage. Not the least of these is the labor situation, which is much easier to control in an industrial community, such as that at Roebling, than it is in the larger center. Again, the plant at Roebling contains the 12 open-hearth furnaces furnishing all of the steel for both the Kinkora works at that point and the main works in Trenton. It contains a blooming mill, a rod mill working on a high tonnage basis, and a full equipment of wire mills. The expansion has now added a new rod mill at that point, which is described in the following paragraphs.

Because of the various products to be rolled on this new mill, including both steel and copper rods, flats and strips, many problems had to be solved in connection with its design. The mill takes 4-in. billets, which have been reheated after leaving the blooming mill, and rolls them down into rods of 9/32 to ⅝ in. diameter or into flats or strips varying from 7/16 to 3 in. wide and from 1/16 to ⅛ in. thick. The mill has been designed for an annual output of about 40,000 tons. It had been under consideration for a long time, and about 18 months ago it was taken up in earnest with the idea of pushing it through to completion as soon as possible. It has now been in successful operation since the second week of August.

Designed for either gas or oil fuel, the continuous

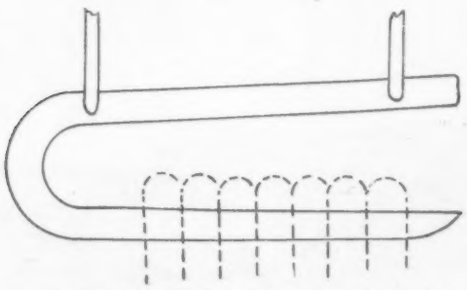


Under the Overhead Pipe Trestle Appears the Heating Furnace for the Rod Mill (in the Opening). The rolling stands are located in the taller steel building in background and extending well to left of the steel stack. The brick section at left houses the Unaflow steam engine which runs the mill. At extreme left appears the end of the loading shed

At Head of Page Is a General View of the New Rod Mill Building, with Loading Shed at Left, Rolling Mill with High Monitor in Center, Engine Room and Furnace Room at Right

type gravity discharge furnace, 50 ft. long, is using oil at present. Arrangements may be made, however, for the use of producer gas if at any time it may seem desirable. Air for combustion is pre-heated in a cast iron stove located between the furnace and the stack, where the heat is supplied by the outgoing gases from the furnace. A fan handles this air at a pressure of 5 to 7 oz. Billets are shoved into and through the furnace from the loading skids by means of hydraulic pushers.

All in all, the mill contains 12 stands of rolls. One of these is a 3-high roughing mill, 18 in., operated at



Diagrammatic Representation of Hook Suspended from Loading Crane to Handle Hot Coils of Wire Rod or Other Similar Material

a speed which reaches a maximum of 78 r.p.m. This takes the billets and reduces them in 7 passes to a size suitable for handling in the rod mill proper.

From the roughing mill the elongated billet is fed continuously into an intermediate 14-in. mill consisting of three stands. From here it is fed again continuously through two stands of 12-in. rolls and thence to the finishing mills, consisting of six stands, varying from 10 in. to 11 in. in diameter.

These six stands of the finishing mill constitute a looping mill, two of the passes being followed by automatic repeaters throwing the rod back in each case into the next pass. The six stands of this group are arranged in three lines, the first of which contains three sets of rolls with the same driving pulley, while there are two on the second and one on the third.

Pinion housings of the finishing mill are of the inclosed continuous oiling type, built by the Treadwell Engineering Co., New York, and fitted with Falk herringbone pinions. Gravity lubrication is used on the mill pinions and the main drive bearing; this system consists of pump, filter and tanks. Otherwise, the equipment was built in the plant of the Roebling company, where the entire layout was designed. The maximum speed of the finishing rolls is 450 r.p.m., which corresponds with a rod speed of about 1250 ft. per min. The finished rod, as it leaves the roll, is automatically reeled on one of three reels provided side by side for this purpose. Scrap bundlers and shears and the other usual auxiliaries in a mill of this type are provided.

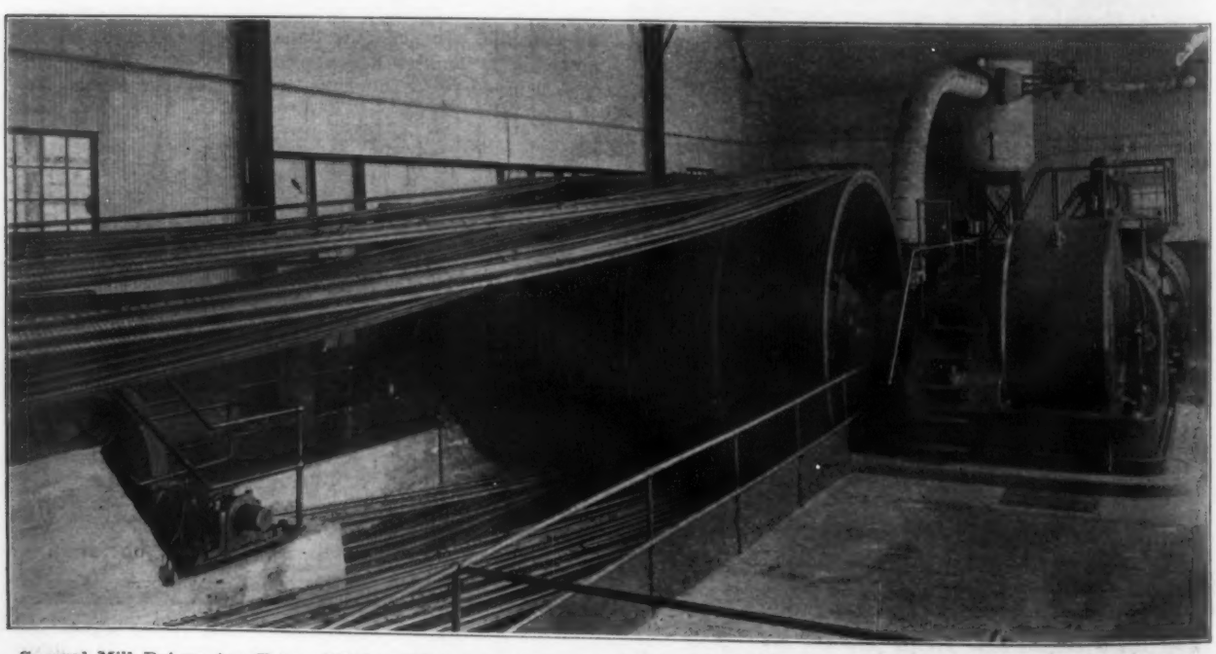
Special attention has been given to quick roll changing, both for changes in section and to replace rolls which become worn in service. Open top and straight side housings are provided, together with outside clamps for holding the roll bearings in place. In addition to the general overhead traveling crane commanding the entire mill building a small special crane is run over the finishing stands to facilitate changing rolls in two or more stands simultaneously.

Handling of the finished rods was one of the problems which gave concern. Methods in vogue are very costly in labor, consequently a special arrangement was provided in this mill, including a buggy or receiving car and crane system. The bundle, discharged from the reels on which it is wound up, is carried by floor conveyor system to an electrically operated buggy. When enough coils have accumulated in the buggy, each stacked on edge, an overhead crane (spanning the conveyor position and the railroad track carrying the outgoing cars) picks up a nest of bundles by means of a special boom or hook, and deposits them in the car in an orderly fashion.

Unaflow Engine Drive

Power for the mill is provided by a single-cylinder Unaflow engine built by the Mesta Machine Co., Pittsburgh, and having a cylinder 56 in. in diameter by 48-in. stroke of piston. The rope sheave shaft of this engine is direct connected to the 14-in. intermediate mill. The drives for the other mills are obtained from the sheave by manila ropes on the British principle, including stands both sides of the direct drive; the breaking down mill is toward the cylinder end of the engine, while all the other mills are clear beyond the engine. Steam is supplied at a pressure of 160 lb. per sq. in., while the engine is connected to a central condensing system through which a vacuum of 25 to 26 in. is secured.

The building, as shown in the general illustration of the mill, is of the usual steel frame construction, with corrugated steel sheets for roof and siding. A large amount of glass is used, however, on the sides, while ventilation is taken care of through the monitor roof. The main part of the building, housing the mill



Several Mill Drives Are Taken Off from This Broad Rope-Drive Pulley. The shaft of the pulley is directly operated from the Unaflow single-cylinder engine and is directly-connected to the 14-in. intermediate mill. Beyond the pulley, and hidden from view by it, is the drive for the roughing set, its ropes appearing as the group at left center of pulley. The drives nearer the observer are for the continuous and looping stands constituting the finishing end of the rod mill

From the Continuous Type Gravity Furnace at *A*, Heated Billets Are Passed Successively Through the 3-High Breaking Down Rolls, the Intermediate Set of Three Stands, the Two Preliminary Finishing Stands and the Six Looping Stands of the Finishing Train, Emerging as Wire Rod or as Flats or Strips. Rods are coiled on the reels in center foreground and carried away by the conveyor chain shown. At the left is the pulpit from which reels and conveyor are controlled. At extreme right, behind the windows, are the Unaflow engine and the rope drive actuating all the stands of rolls

proper, is 65 by 260 ft., and there is a lean-to on either side, that on one side containing the engine and furnace, while the one on the other side covers the conveyor and loading system and extends considerably beyond the end of the main structure. The construction of the entire mill, including the erection of the fabricated steel, which was purchased, was carried out by the company's own organization, and most of the mill equipment was built in the company's shops.

There are railroad tracks leading into the building at each end, for easy handling of material direct into the cars. The output of the mill is to go mostly to the Trenton plant, where it is to be finished into wire, cable, etc., for the market.

Mill scale is dumped direct into scale cars, being handled by means of a clam shell bucket and overhead crane. There is also a general settling basin for scale outside the building.

DENOUNCES GREED

Judge Gary Speaks at Civic Forum on Important Subjects—Opposes Bonus

Judge Elbert H. Gary, chairman United States Steel Corporation, in an address before the Civic Forum and League for Political Education at the Town Hall, New York, Nov. 30, reaffirmed his position in regard to a number of important subjects. "In many lines of business, at the present day," said Judge Gary, "if not to the extent which was formerly characteristic, there is, in conduct on the part of both the employer and employee, unfairness, greed, reckless and brutal disregard for the proprieties and decencies of human contact. If money is acquired by reason of these delinquencies it would be appropriate to hand the amount to those who have unjustly suffered.

"Prices just now in many respects and in many places are unconscionable, and they enter into the very high cost of living. If any one, producer, tradesman, or workman, after doing justice by those to whom he is responsible, can and will do anything to reduce the high cost of living, he will thereby give evidence of his gratitude for being permitted to live and work in this country of plenty and prosperity."

Judge Gary spoke strongly in opposition to the proposed soldiers' bonus, but he was strongly in favor of liberal appropriations to care for the injured soldiers. Referring to the agitation in favor of cancelling or reducing the debts of foreign countries to the United States, Judge Gary declared the proposition to be irrational and preposterous.

"It has been asserted by certain foreign nations," said Judge Gary, "that they are willing to pay their debts when their debtors pay them and not before. Did any one ever before hear such a condition insisted upon by any self-respecting, solvent individual or nation? Does any one of these foreign nations, through its courts, allow individual debtors to other individuals to postpone payment until these debtors have collected their claims against third parties? What would a foreign court say to such a defense to a suit brought upon a note given for borrowed money?"

Republic Iron & Steel Co. Improvements

Plant improvements under way at the Youngstown properties of the Republic Iron & Steel Co. include partial rebuilding of the Bessemer plant, changes to the billet and sheet bar mills, reconstruction of a blast furnace in the Haselton group and erection of an additional battery of by-product coke ovens. The new by-product coke oven addition is now being completed.

In the Bessemer department, a cupola is being dismantled and a mixer is being built in its place.

The billet and sheet bar mills of the plant are being replaced in parts with modern equipment. Electric drive will be substituted for hydraulic operation of these units.

Plans are being prepared for the addition of two buttweld tube mills at the Poland Avenue plant in Youngstown. The modernization of the Bessemer plant will enable the company to produce a larger tonnage of Bessemer iron, and supply semi-finished steel for the additional buttweld pipe capacity.

NEW FIRE CLAY BRICK

Uniformity in Size Claimed as Feature—Advantages for Blast Furnace Linings

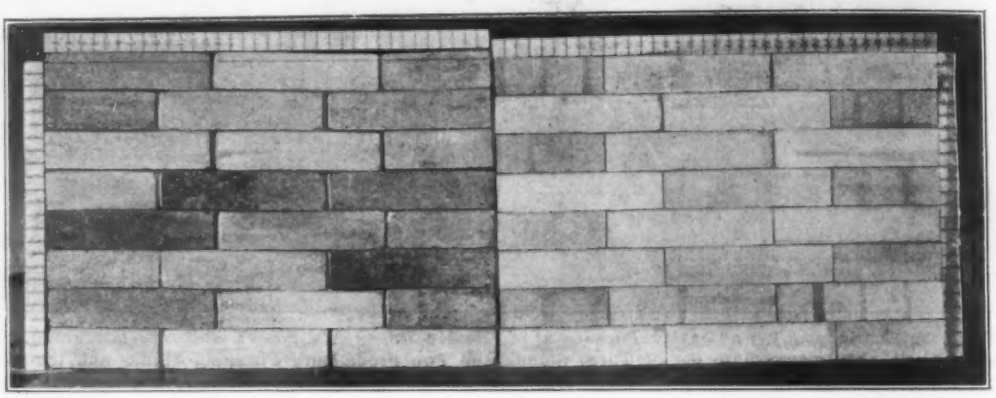
Engineers for a long time have desired a uniformity in size in refractory bricks for metallurgical use so that joints would reach smallest possible proportions. In blast furnace linings, in coke-ovens and in heating, heat-treating and other mill furnaces, the tighter the joint or the closer the bricks, the longer, has been the general contention, is the life of the furnace or lining. In fireboxes under boilers a fire brick of dependable uniformity has been an essential long desired. At a meeting early this year of the Metropolitan section of the American Society of Mechanical Engineers in New York, Edwin B. Ricketts, assistant to chief operating engineer of the New York Edison Co., speaking as one who has made a special study of boiler wall construction, emphasized "the major importance of uniform size, since lack of uniformity made thick joints necessary, these being the starting point for the destruction of the walls. The ideal was a brick-to-brick contact with only a thin wash of fire-clay to fill the pores." It is clearly evident that in a blast furnace the use of brick so uniform in size that the lining made with them would approach in continuity a solid mass of fire clay should insure much less liability to disintegration and hence a longer life.

A new fire clay brick, for metallurgical and other purposes, which, it is claimed, meets the ideals briefly outlined above, has been put on the market by the General Refractories Co. 117 South Sixteenth Street, Philadelphia. It is made by a new process, patented by the company and developed at its Olive Hill plant at Olive Hill, Ky. It is the result of extensive experiments conducted by the company over a period of years, the aim being to produce a brick so uniform as to reduce joints all possible.

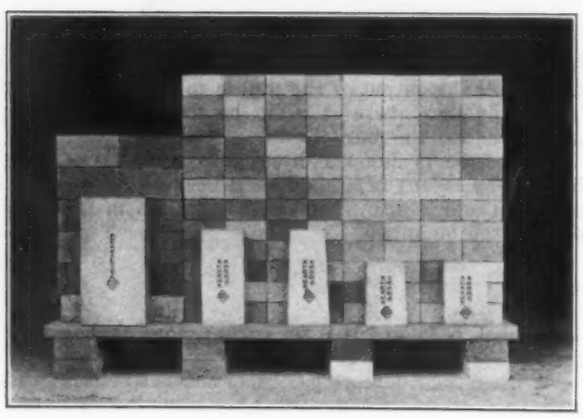
The new process is claimed to turn out a brick absolutely uniform in size and with no sacrifice of quality. Essential features are described as regulation in the mixture, grind and density. Some of the brick made by the new process are shown by the illustrations. In one of these there is a comparison between a uniform brick made by the new process and a pile of brick of the same dimensions not made by this process. Several piles of 3-in. thick brick made by this process, six high, showed a total variation of less than 1/16 in., or less than an average of 1/96 in. for each brick. The other illustration represents a stack of standard blast furnace sizes made by the new process. Plans are under way to equip other plants of the company.

Already blast furnace records in the older form of brick have shown an output of 1,500,000 tons of pig iron on one lining. On the claim that the new brick can improve on this performance, there will be also the added advantage of the elimination of extra cost due to cutting of brick to fit and of the saving of the large amount of bonding material usually used to fill up joints.

Wall Laid Up with 13½ in. x 6 in. x 3 in. Straights (Right) Together with 9 in. x 6 in. x 3 in. Straights. The left half is brick of the same sizes not made by the new process



Standard Blast Furnace Shapes (Below) of Fire Clay Brick Made by New Process



Pension Plan of British Empire Steel Corporation

WASHINGTON, Dec. 3.—Providing payment to any male employee who has been 25 years in the service and has reached the age of 65 or more and who is retired either at his own request or that of his employing official, the British Empire Steel Corporation has instituted a pension fund, according to a report received by the Department of Commerce from Consul Charles M. Freeman, Sydney, Nova Scotia. Pensions will be made monthly at the rate of 1 per cent of the average monthly pay received by retired employees during the past 10 years of their service, multiplied by the number of years of their entire employment. Benefits are also provided for female employees who have been 25 years in the service and have reached the age of 55 or more and have retired at their own request or that of employing officials.

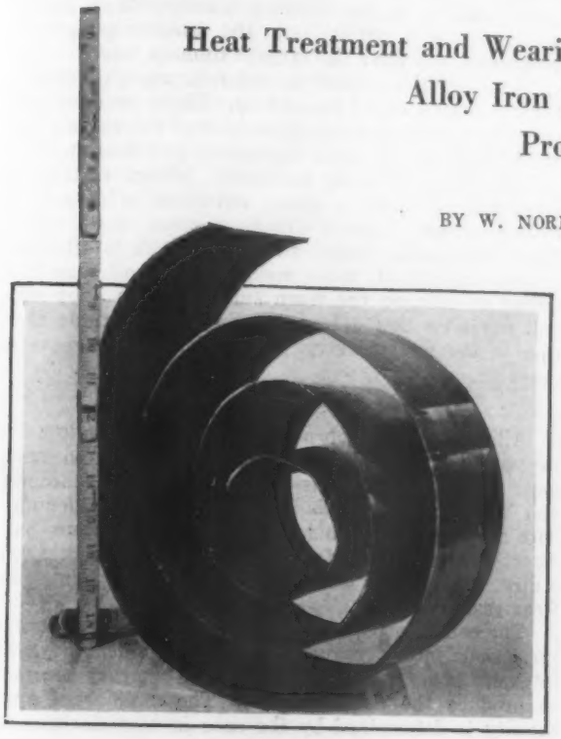
Any employee who has been in the service 15 years and has become permanently incapacitated also is to be pensioned. The board of directors furthermore may direct the pension committee to include employees whose length of service has not reached the limits or employees of those ineligible for other reasons. Employees who have been in the service 30 years and during the last 10 years received $83.33 monthly or $1,000 per year will get 1 per cent of the monthly wage, or 83c. multiplied by 30, or $24.90, but it is provided that no pension shall be more than $25. The plan differs from that of most other corporations by not providing for contributions from wages. Effective Dec. 3, it is the purpose of the corporation to apply it to remove a source of complaint, especially among miners.

The Ford Motor Co., having recently purchased a site of 45 acres at Norfolk, Va., has purchased an additional 10 acres as the site for an assembling plant. Proposed buildings include a three-story main building 300 x 800 ft. and several other units necessary to the production of 300 cars per day.

Molybdenum in Cast Steel and Iron Rolls

Heat Treatment and Wearing Qualities of Low Carbon—Alloy Iron Rolls—General Properties

BY W. NORMAN BRATTON*



ALLOY rolling mill rolls, both iron and steel, have become an important part of the regular equipment. Alloy rolls are not a new development; several types of cast steel and forged alloy rolls have been on the market for some time under various trade names. This article discusses one of the more recent developments in alloy roll metallurgy. The author has devoted much study to the alloy roll industry.

THE consumption of alloys in carbon steel rolls has increased remarkably within the past ten years. Alloying elements, commercially successful in rolls, were beyond the experimental stage in 1913. The wide usage of alloys in certain classes and compositions of rolls was established some years thereafter. Now alloys are generally recognized as prime factors in reducing rolling costs. One of the contributing causes for recent progress in this direction is the use of molybdenum, and the object of this article is to present some considerations bearing on the reasons why molybdenum is physically and commercially efficient.

In forged steel rolls, alloys are used in all compositions. In cast steel rolls, the field for alloys was almost entirely in high carbon steel rolls, previous to the introduction of molybdenum. Chromium is one of the elements in all alloy cast steel rolls produced in the United States. In addition to chromium are nickel, vanadium, and high percentage of manganese. Molybdenum is added to chromium either alone or in addition to one of the other elements just mentioned.

The combination of alloys best to serve a given purpose depends primarily upon the resistance to wear and breakage. Comparative tests take into account also the machining qualities and surface properties of the rolls. Unless there are peculiar circumstances, the type and class of roll which reduces rolling costs, by less wear and breakage, is the roll which is used. The actual machining time in dressing a roll is usually a small percentage of the final cost of the roll. Whether it machines hard or soft is often overbalanced by the number of times it must be taken out and put into the mill, transported to and from the roll shop, etc. The surface properties of rolls are adjusted by analyses and heat treatment with the exception of surface cracks, (fire cracks). These are difficult to control and seem to vary with the composition of alloys employed.

After the raw material and processes used in making rolls are as good as is commercially possible, alloys are the last means to increase the economic efficiency of rolls. Molybdenum was first tested in rolls during 1920. Since then compositions of varying analyses and uses have been developed. Molybdenum is now used in all the four classes of rolls, namely: Low-carbon steel, high-carbon steel, iron cast in sand molds (sand rolls), and iron cast in metal molds (chilled rolls).

Low-Carbon Steel Rolls

For the severe service in blooming mills and roughing mills, the low-carbon steel molybdenum roll was developed, yielding a high degree of strength, toughness, and wear. Before the molybdenum rolls were placed in service there was no preliminary way to determine the resistance to wear. On the basis of hardness and carbon contents comparable to other alloy steels, the density and grain size of the molybdenum castings proved favorable and were accepted as an index of the wearing properties in service, taking into account also the previous performance of molybdenum steels for tough-hardness and hot wear.

The manufacture of molybdenum steel is extremely simple. The molybdenum is added to the molten metal in the furnace before the slag comes to the top and remains in the steel without passing into the slag. Accordingly the molybdenum diffuses thoroughly through the molten metal for such a long time that there is no doubt about the intimate and uniform mixture of the alloy with the steel.

Heat Treatment

After the rolls are cast a plain anneal may be given, or for special requirements the rolls are cooled in air. This last treatment is a recent advance in the metallurgical practice of roll foundries. A complete treatment follows which is used in whole or in part or modified as preferred. Starting with the rolls as cast, an anneal is given at high temperature to break up the casting structure, then an anneal from a temperature slightly above the critical point for grain refinement. The rolls are next machined and after this they are heated to a temperature about 200 to 250 deg. Fahr. above the critical point and cooled in air, being allowed to cool until the temperature is equalized throughout the mass below a red heat. The last and final step is the drawing temperature to lower the hardness as desired and increase the toughness.

The air treatment for cast steel rolls has an effect up to a depth of six inches depending upon the size of the roll. Following this departure from annealing only, future refinements will be more drastic cooling means

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and media so that small sizes of cast steel rolls may eventually be given liquid quenching and drawing treatments.

The wearing qualities are now definitely known. The figures in some cases are surprising, showing comparative ratios that are three and four to one. Extraordinary results in some instances are those, where the service was as much as 12 times the maximum previously obtained. The records below were obtained under five different classes of rolling conditions. Item six is a molybdenum cast steel roll versus a forged steel roll.

1.—12 days versus 4 days; dressing same.
2.—18,000 tons versus 7000 tons; dressing $\frac{1}{8}$ in. versus $\frac{1}{4}$ in.
3.—4 weeks versus 1 week; dressing same.
4.—Over 200 per cent better; no fire cracks.
5.—572,000 tons versus 180,000 tons; life of roll.
6.—500 tons versus 300 tons; dressing $\frac{3}{4}$ in. versus $\frac{1}{2}$ in.

Results such as these are positive evidence of increased service and consequent reduction in actual rolling costs.

An example of the strength and toughness of molybdenum steel rolls is found in the illustration where it was necessary to roll 9 in. x 9 in. ingots to 5 in. x 5 in. billets on a 16-in. mill. The 2-ft. rule shows the actual size and gives an idea of the small cross sectional area at the bottom of the pass which resists the heavy repeated working stresses and impacts.

Molybdenum has established itself as one of the alloys in high carbon steel rolls. Figures have been given to the writer on relative service of molybdenum to other high-carbon alloy compositions, but not for publication. Molybdenum is being used with economic success and satisfaction.

Alloy Iron Rolls

With cast iron rolls the toughness is negligible and the strength is much less than with steel rolls. The wear, smoothness, and hardness of surface of the roll are all important. Without toughness any undue treatment or other abnormal condition will cause breakage.

The alloy which will effect an economic improvement in iron rolls in wearing and finishing properties has a promising future. Molybdenum chilled rolls produce a better finish on sheets, and are especially useful to producers of high finished sheets. The variables in roll foundry practice more seriously affect chilled iron rolls than steel rolls. Alloys which affect the depth of chill so that it cannot be uniformly taken care of in foundry practice are not suitable for chilled rolls. Molybdenum is free from this objection. The molybdenum is in the iron throughout its manufacture and the chill is read from tests before tapping. When molybdenum is present the graphite is in the form of nodules instead of flakes. The strength of the iron is consequently increased.

General Properties of Rolls

The relative properties of the different classes of roll compositions may be given in the following order from characteristics which are most prominent in each class. Physical properties are based on tensile tests.

	First	*Second*	*Third*
Low-carbon steel..	Toughness	Strength	Wear
High-carbon steel..	Strength	Wear	Toughness
Sand rolls.....	Wear	Finish	Strength
Chilled rolls.....	Finish	Wear	Strength

For example, comparing the four classes, low-carbon steel rolls have the most toughness, less strength than high-carbon steel rolls, more strength than the iron rolls, and the least resistance to wear, etc., noting however, in continuing this general system of comparison in the other classes of roll compositions, that chilled rolls resist wear better than high-carbon steel rolls and better than sand rolls. As an arbitrary means of classification, the dividing line between low-carbon and high-carbon steel is taken at 0.25 per cent carbon below the eutectoid.

The arrangement above is to be taken only in a general way since there are specific instances where high-carbon steel molybdenum rolls are used as semi-finishing rolls intermediate between sand and chilled rolls, and high-carbon steel molybdenum rolls that show better wearing properties than sand rolls. The table will serve, however, to bring out the necessary properties that a combination of alloys must economically increase in each class of rolls, and the reasonable certainty that a major alloying element that has this accomplishment throughout the entire category of properties, will have the largest tonnage use.

A source of weakness in hot rolls made of steel are surface cracks, called fire cracks. These may be caused either by contraction and expansion of the surface layer of the steel roll or by compression and tension on the roll surface in working hot steel. Where sections are large and are given a heavy reduction of area in the rolling process surface cracks develop most rapidly. When the cracks deepen so the strength is affected it is necessary to cut more metal off the roll than is required to true up the worn surface. The alloy which will minimize this defect will have a favorable reception in the roll industry. Molybdenum decreases fire cracking.

Some Properties of Molybdenum

Alloys such as chromium, nickel, vanadium and molybdenum produce strength, toughness and resistance to wear. Nickel is a ferrite element, chromium and vanadium are carbide elements. Molybdenum is both a ferrite and carbide element. Molybdenum has a direct effect upon the ferrite as a toughening alloy and a direct effect upon the carbides as a strengthening and wear-resisting alloy.

The comparative efficiency of alloys in steel depends upon their intensity and commercial applicability. The intensity is defined as the cost of the quantity necessary to produce the desired effect. The commercial applicability is determined by the ease in manufacture and heat treatment, and the ease in fabrication.

The intensity of molybdenum is almost directly proportional to the molybdenum content up to 0.50 per cent. The effect of molybdenum is pronounced in percentage contents from 0.15 to 0.25 per cent. This is the range of molybdenum content in molybdenum automotive steels. On the other hand types of molybdenum steel are in commercial production wherein 0.70 to 0.90 per cent molybdenum is specified. The dual effect of molybdenum upon both the ferrite and carbide is especially valuable in combination with chromium alone or in combination with chromium and nickel, or chromium and vanadium. Molybdenum has its own individual effect and serves to accentuate the desirable properties of the other alloys with which it is combined.

The fractional percentages which are required to produce results can leave no doubt as to the intensity of molybdenum. A metallurgical digest of results in the numerous technical papers on molybdenum steels testifies to the advantages of molybdenum steel in ease of manufacture, heat treatment, and fabrication.

Selection of Alloys

The final alloy or alloys in rolls will be those that function best to increase economically the desired properties and give the least amount of trouble in manufacture and heat treatment. Alloys will never be a cure-all. However, when the conditions are right metallurgically and otherwise from start to finish of the roll a judicious selection of alloys and alloy compositions effects a reduction in rolling costs.

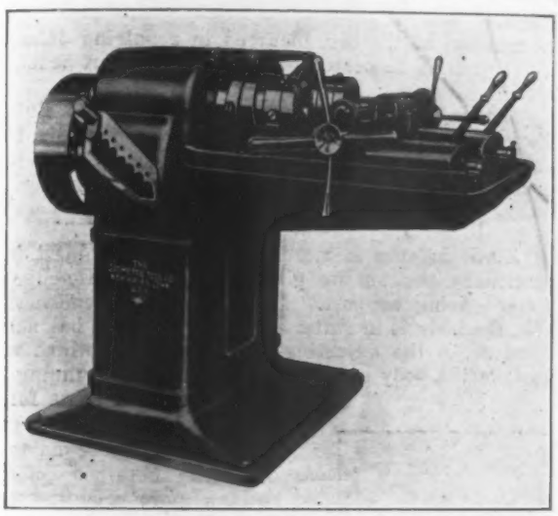
Analyses and treatments of alloy steel and alloy rolls have received a new impetus. It is true that molybdenum is a contribution in this progress backed by sound reasoning and splendid service. The data so far gathered from hundreds of molybdenum steel and iron rolls and repeat orders from many steel mills are definite evidence of the merit of molybdenum as an alloying element in rolls. With the experience that has been gained during the past three years it is only logical to expect further advances and a solution of problems which will benefit the industry as a whole.

Domestic production of the Ford Motor Co., for the week ended Nov. 20, was 40,226 cars and trucks while 1713 Fordson tractors were produced during the same period. Production at the Lincoln division totaled 134 cars.

Double-Spindle Threading Machine

The 1½-in. double-spindle threading machine illustrated is a recent addition to the line of the Geometric Tool Co., New Haven. In general design it is similar to the ¾-in. machine described in THE IRON AGE of March 3, 1921, and is intended also for work in which the threading time for both pieces is sufficient to permit the operator to chuck and start a second piece while the first is being threaded. For this class of work the double spindle units are rapid producers and are said to handle practically as much work as two single spindle machines.

The 1½-in. machine cuts threads of ¾, ⅞, 1, 1⅛, 1¼, 1⅜ and 1½-in. diameter. The greatest cutting



Two-Spindle Threading Machine for Use Where Threading Time Is Sufficient for Operator to Chuck and Start Second Piece While First Piece Is Being Finished

length at which the swinging gage can be set at one time is 9 in., but with resettings a length of 14 in. may be obtained. With a countershaft speed of 296 r.p.m. and the change-speed lever set at ¾ in., spindle speeds are 74 r.p.m.; when set at 1½ in., the spindle speed is 38 r.p.m.

The machine may be equipped with a 6 hp. motor drive. The net weight is 2165 lb., and the floor space required is 48 x 65 in. The countershaft driving pulley is 13½ x 5½ in., and the weight of the countershaft is 150 lb.

A New Abrasive Cut-off Wheel

Cut-off wheels having Redmanol, a phenol resin of the same family as Bakelite, as a bonding agent, have been placed upon the market by the Carborundum Co., Niagara Falls, N. Y. The Redmanol is said to give a wheel that combines strength, porosity, hardness, and resistance to heat; it does not soften or melt and the wheel is free cutting.

For cutting high-speed steel, Stellite and general steel alloys, an Aloxite Redmanol wheel is said to be used to advantage. In cut-off work it is general practice to use wheels 12 in. in diameter, and these wheels can be made as thin as $\frac{3}{32}$ in. Wheels 12 x $\frac{3}{32}$ or 12 x ⅛ are popular sizes.

Carborundum Redmanol wheels are also available, these being used for general cut-off work on materials of low tensile strength and for cutting carbons and brushes of graphite and copper. For these a wheel in 50 C grit, 4 grade is recommended. In both types, wheels of 8, 10, 12 and 14 in. diameter are available.

Performance records of the Aloxite Redmanol wheel have been compiled by the company. With a wheel 12 in. in diameter, $\frac{3}{32}$ in thick, in 50K grit, 8 grade, running at 4000 r.p.m. five cuts were made on a piece of Chesterfield metal ⅝ in. square. The wheel loss is claimed to have been $\frac{1}{32}$ in. and the average time per cut 8 sec. Diamond alloy tool steel ⅞ in. square was cut in 10 sec. per cut and the wheel loss after two cuts was $\frac{1}{32}$ in. Three cuts of Mohawk tool steel 1¼ x ¾ in. were said to average 9 sec. per cut, with a wheel loss of but $\frac{1}{32}$ in. A piece of Stellite $\frac{1}{16}$ x 2 in. is said to have been cut at the rate of 12 sec. per cut, with a wheel loss of $\frac{1}{16}$ in. after two cuts.

Old Firms in St. Louis

ST. LOUIS, Dec. 4.—The St. Louis Chamber of Commerce has been compiling a list of names of firms which have been doing business in St. Louis 50 years or more. The list has grown to more than 200. After the list is completed the firms will be honored at a banquet, when executives and leading citizens will gather to pay tribute to them. The list, as compiled, with the year the firm was established, includes the following:

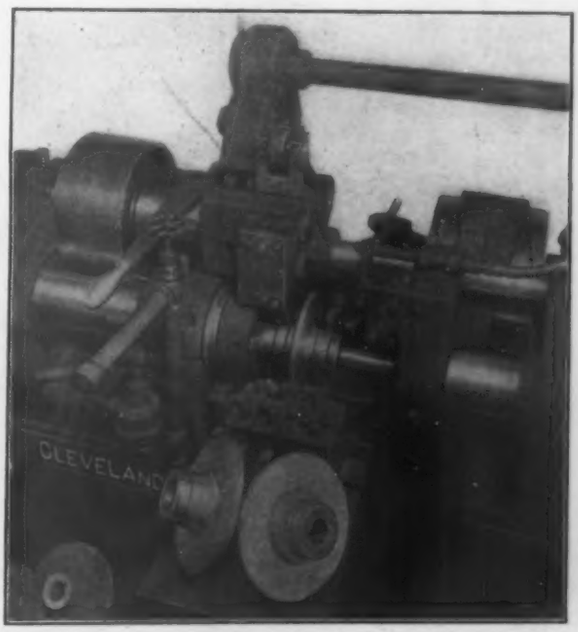
American Car & Foundry Co., 1862; Beck & Corbitt Iron Co., 1852; Bridge & Beach Mfg. Co., 1837, stoves; Buck Stove & Range Co., 1846; Campbell Iron Co., 1867; Charter Oak Stove & Range Co., 1847; Curtis & Co., Mfg. Co., 1854; Fulton Iron Works Co., 1852; Hemp & Co. Corporation (sheet metal); More-Jones Brass & Metal Co., 1874; Pauly Jail Building Co., 1856; Stupp Brothers Bridge & Iron Co., 1858; Joseph Wangler Bros. Boiler Works, Wrought Iron Range Co., 1864.

Device for Demagnetizing Chucks

The Thorn demagnetizer, a device recently placed on the market for use in shops and tool rooms, is operated directly from a electric light socket and a motor is not employed. It is built for 110 or 220 volt alternating current circuits. Portability and the small space occupied are features of the device. A. J. Littlejohn, Syracuse, N. Y., is the distributor.

Automobile Hubs Machined Automatically

An automatic machine for finishing automobile hub forgings and adaptable also for machining second operation work on arbors, such as bevel gears, bevel



Automatic Machine for Finishing Automobile Hub Forgings. The arrangement of work and cutters is shown above

gear housings, pinion gear shafts and transmission gears, has been placed on the market by the Cleveland Automatic Machine Co., Cleveland. The machine is similar in action to the automatic piston machine manufactured by this company.

The hub is mounted on an arbor as illustrated, one end of which is chucked by means of a hand-operated air chucking mechanism. The other end of

the arbor is supported by a roller bearing in the tool-stock spindle and is driven by a boss on the spindle hood engaging in the lug on the arbor. The tool operations follow rapidly, working simultaneously.

The overhanging arm, mounted on the tool stock spindle and supported rigidly in the rear, carries three cutters, one of which turns the flange diameter and the other two rough turn the small diameter and face one end. The overhead turning attachment mounted securely on the spindle head and operated longitudinally from a cam on the camshaft carries two cutters for rough turning the other small end. There are three cutters in blocks mounted on the rear cross slide which rough face the flange and rough form and face one end. Both ends are finish formed and the front of the flange is finished faced by four cutters mounted on the front cross slide. A hub is produced at each cycle of the camshaft.

The machine is driven from a single pulley with a clutch which automatically stops the machine when each hub is completed. The lever for starting as well as the air control lever are within easy reach of the operator. The machine is arranged either for belt or for motor drive. It is stated that one man can easily operate three machines and that each machine will produce twelve hubs per hour from forgings.

BALANCING HIGH-SPEED FANS

Importance of Correct Dynamic Balance Stressed —Static Balance Is Not Enough

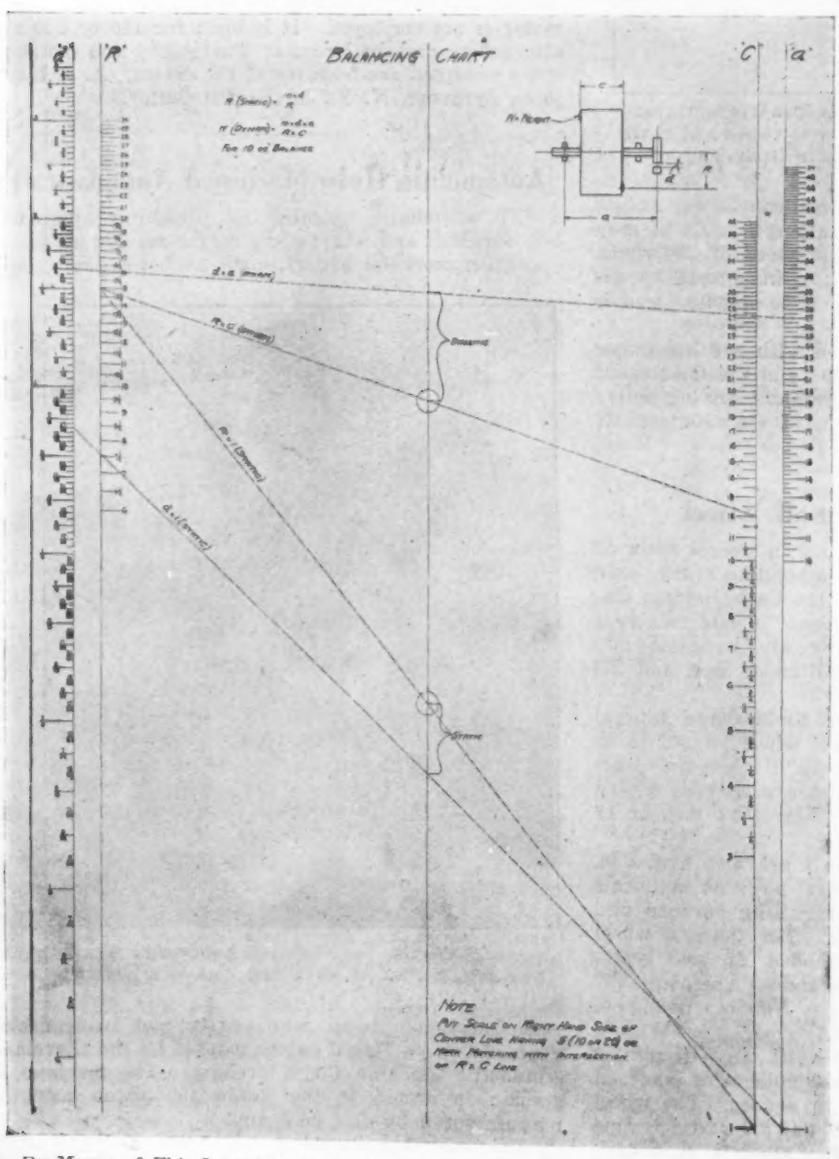
BY ARTHUR L. GREENE

OCCASIONAL troubles experienced with fan wheels, supposedly balanced perfectly, develop operating difficulties due to vibration. Although not always serious, this may become so, and can be removed only by rebalancing the fan in position, which at best is a difficult task for one without special experience. It is needless to dwell on the expense and loss of time commonly resulting from unbalanced fan wheels, to make no mention of the cost incurred in repairing damaged parts such as dislocated fan blades, worn-out bearings, etc.

Efficient results are now reported by the Buffalo Forge Co., Buffalo, in getting, so far as possible, both static and dynamic balance in high-speed, high efficiency fans.

What Are Static and Dynamic Balance?

Static balance is merely balancing an object in a stationary position by placement on a knife-edge or roller-bearing support. If it shows no tendency to roll, the body is in static balance. Dynamic balancing, however, is the adjusting of those forces which tend to take the body out of equilibrium when running, as differentiated from those forces acting on a body when at rest.



By Means of This Logarithmic Chart the Man Doing the Balancing Is Enabled to Determine Quickly the Amount and Position of Weights Necessary to Give the Fan Both Static and Dynamic Balance

Now the "running balance" as ordinarily obtained consists of nothing more scientific than arbitrary addition and subtraction of weights to counterbalance irregularities in the blades or hubs, making for uneven distribution of weight in the fan and thereby causing vibrations. While this method is far from scientific and is not based on formula or rules, it is possible to attain as true a balance by this system as with the use of the most complicated balancing machine. The difficulty arises, however, as might be suspected, in that the method is purely arbitrary and depends for its success, in just about equal proportions, on cut and try methods, and on possession by the operator of a "sixth sense."

This slow and laborious method depends too greatly on the human equation and always leaves the ultimate outcome of the test an unknown quantity. True dynamic balancing, however, represents utilization of a device to obtain a scientifically true running balance. Having a perfect static balance does not insure a perfect dynamic balance. And if the fan is not in dynamic balance a couple will be set up tending to cause the end of the shaft to travel around in circles, with consequent vibrations just as serious as if the fan were statically unbalanced.

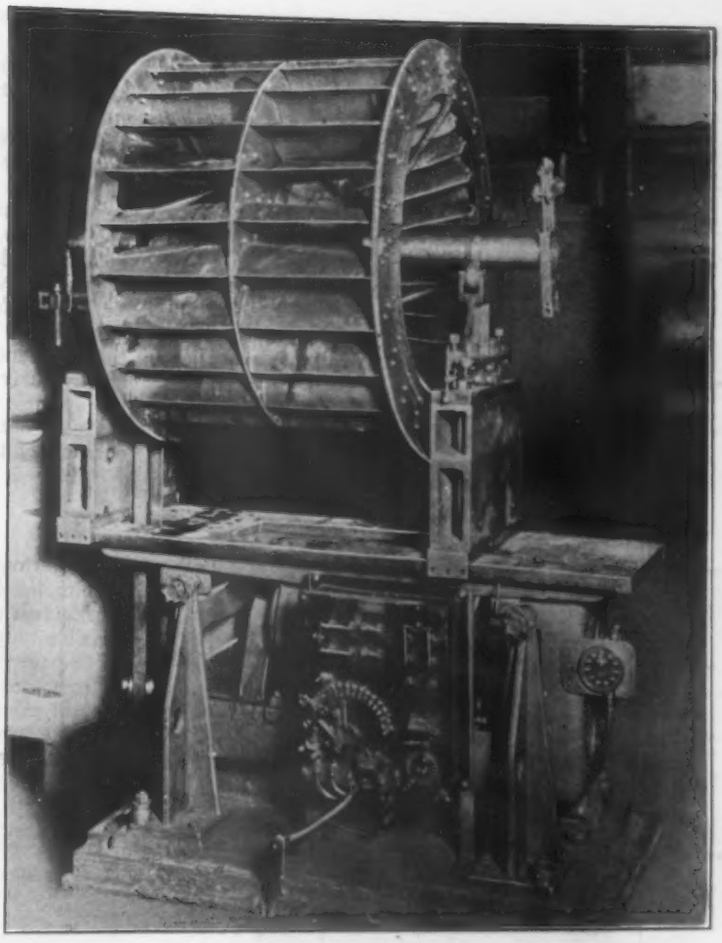
At the Buffalo plant it has been the custom for many years to give all the P. M. X. fans (planing mill exhausters) "B" volume, and steel pressure blowers, a running balance in their own bearings. This operation is comparatively easy, because

these fans are self-contained, having no separate pedestals to erect and line up. The speed is fairly moderate and the blast wheels have already been given static balance as assembled.

Something in the nature of a "bogey man" arose for the fan manufacturer, however, when high-speed fans for motor and turbine drive came into use. For various reasons it was found impracticable to perform the running balance in their own bearings, chief objections being that a great deal of power was required to run these outfits at full speed, that the independent bearings would require considerable time and expense to set up and that the many types and sizes of motors required would necessitate a large and varied testing installation.

Hence the Buffalo Forge Co. has installed two dynamic balancing machines. The object to be balanced is rotated at comparatively slow speed while vibrating supports allow the rotating object, when out of balance, to indicate this unbalance by exaggerated vibrations. By means of adjustments made in both the angular position and radial displacement of a known weight, attached to the shaft or mandrel and rotating with the object, a new centrifugal force is set up which exactly compensates for the force or forces tending to unbalance the rotating object, and brings the object into a state of rotating equilibrium.

By an adjustment of the balancing machine, the whole machine may be made to vibrate to the rotation of a statically unbalanced object. On the other hand, another adjustment of the machine will cause only one of the two bearings supporting the rotor to vibrate and will thus indicate the dynamic unbalance of the rotating object. Static unbalance can be detected much more accurately by a balancing machine than on the most carefully made knife-edge ways.



Balancing Machine for Obtaining Dynamic Balance. Exaggerated vibration produced by unbalanced rotors is corrected by adjustment of the angular position and amount of rotating weight attached to the shaft, as shown at right above. This gives data for permanent correction to the rotor, the operator reading from the chart, as shown on page 1512, the necessary adjustment to be made

Having brought the object to a state of rotating equilibrium, either for static or dynamic unbalance, it is easy to determine the amount and position of weights which will permanently compensate for either unbalanced condition. Static unbalance is always corrected first, as a prerequisite to putting an object in correct dynamic balance. A simple logarithmic chart allows the workman who operates the machine to calculate the permanent weight or weights required as quickly as he could caliper and measure the diameter of a shaft.

History of Electric Light

In an interesting booklet of 110 pages the Smithsonian Institution of Washington has issued a compendium of information regarding the development of incandescent, arc and vapor electric lighting, carrying the reader back to the time when a Greek philosopher 25 centuries ago discovered that amber when rubbed will attract light objects. There are many illustrations, especially of the early forms of lights and some of the generating apparatus, culminating with the 1923 patterns.

Particularly interesting is the story of the development of the incandescent light from Edison's first experimental lamp of 1878 and his first commercially successful carbon lamp of Oct. 21, 1879. It is estimated that in the United States today there are about 350,000,000 incandescent lamps, the number of which is increasing at the rate of about 10 per cent per year. The annual demand for new lamps and renewals is approximately 200,000,000 per year, exclusive of miniature lamps. The use of incandescent lamps in all the other countries of the world combined is about equivalent to that in the United States. The average candle power has increased from 16, which prevailed about 1905, to over 60. The average number of watts consumed, however, has remained practically stationary at about 55. This shows that the present lamp has about four times the efficiency of that of 18 years ago. The work was prepared by Henry Schroeder of Harrison,

Powdered Coal for Malleable Iron Melting Furnaces

The Dayton Malleable Iron Co. has decided to employ powdered coal in connection with its melting furnaces, of which are 14 at its plants at Buffalo, Dayton, Ohio, and Ironton, Ohio. The Fuller-Lehigh Co., Fullerton, Pa., is to provide the equipment and apparatus, and three complete plants will of course be required, including the usual distributing machinery, appliances and furnaces. The use of the powdered coal may be extended to the 84 annealing furnaces in the three plants, but attention will first be given to expediting the installation for the melting furnaces.

Steel Furniture Shipments

WASHINGTON, Nov. 27.—The Department of Commerce announces October shipments of steel-furniture stock goods, based on reports received from 22 manufacturers. Shipments amounted to $1,365,600 in October, as against $1,273,259 in September, and $1,227,447 in October, 1922.

Stresses in welded and riveted steel tanks under hydraulic pressure have been investigated by the Bureau of Standards and the results are available in Technologic Paper No. 243 for sale by the Superintendent of Documents, Washington, at 5 cents a copy.

Automatically Controlled Spot Welder

A spot welding machine equipped with automatic control, permitting of high-speed operation, is being marketed by the American Electric Fusion Corporation, Chicago. The range of the machine, which is illustrated herewith, includes production welding operations from the welding of fine wire to the joining of comparatively heavy sheet steel.

With the automatic control provided, the current is turned on and off, and the pressure applied, by the controlling mechanism. The current is applied to a certain definite spot only and in just the quantity and for the length of time necessary. Because of the intense heat and the rapidity with which it can be generated, it is claimed that thousands of welds an hour can be made on small, light stock.

Spot Welder Equipped with Automatic Control. One or a series of spots may be obtained by foot treadle, or operation may be continuous

The welder is driven by a Westinghouse type A. R. S. repulsion-induction type motor operating at a speed of approximately 1100 r.p.m. Mounted on the motor shaft is a quadruple thread worm, meshed with a worm gear, giving a primary reduction between the motor and the lower drive shaft of the gear housing of 1 to 10, which, with equal gears, drives the welder at the rate of 110 spots a minute. Two other gears of the lathe change type are provided, which permit a minimum speed of 80 spots and a maximum speed of 140 spots a minute. Other combinations of gears to suit the work in hand may be used. By substituing a double or a single thread worm and gear in place of the quadruple, a reduction down to 13 spots a minute may be obtained. If a quick change drive is desired, a quick shift attachment with nine steps may be used, giving a range of welding speeds from 20 to 120 spots a minute.

The foot treadle control for starting and stopping the welder is arranged so that one or a series of spots, depending on the kind of work, may be obtained. When the control is fully engaged, the operation is continuous.

Prospectus of World Power Conference

Prospectus of the world power conference to be held at the British Empire Exhibition, Wembley, London, June 30 to July 12, 1924, the first gathering of this kind ever held, has been issued by O. C. Merrill, Federal Power Commission, Washington, general chairman of the American committee. The conference is promoted by the Council of the British Electric and Allied Manufacturers' Association in cooperation with the technical and scientific institutions and industrial organizations of Great Britain and other countries.

The purpose of the conference and the personnel of the American committee were given in THE IRON AGE of Aug. 16, page 408. The outline of the program calls for five divisions under the following classifications: Power resources, power production, power transmission and distribution, utilization of power, and a general division, embracing a number of subjects which are likely to be of primary interest at the conference, but which do not lend themselves to classification in the other divisions.

Papers for submission to the conference will be printed and distributed by the British committee to the members of the several national committees sufficiently early to allow examination and study prior to the opening of the conference. These papers will not be read, but the sessions will be devoted to oral discussions of the subjects with which they deal.

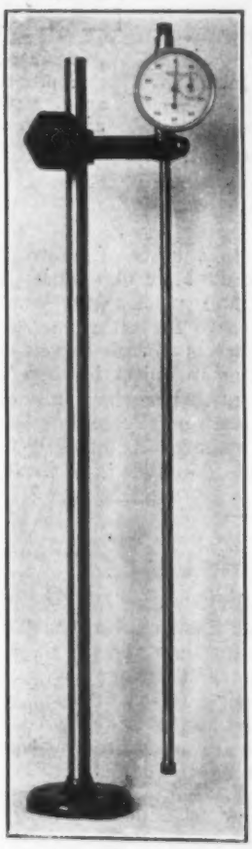
Smoke Abatement

Experimental work by the Bureau of Mines in the elimination of smoke from railroad, industrial, and domestic fuel consumption has shown that it is perfectly feasible to get rid of the greater part of the nuisance. A 32-page pamphlet just issued by the bureau shows by comparative photographs conditions before and after certain campaigns operated and, by diagram, methods of firing in various types of furnaces, by which the fuel is used economically and practically without smoke.

Special Dial Indicating Gage

The special indicating gage illustrated, which was built by the Federal Products Corporation, Providence, for a manufacturer of elevators, represents an unusual attempt in the manufacture of indicators.

The rack is 20 in. long from the bottom point to the bracket and is cut the entire length. The indicator hand makes 20 revolutions to the full stroke of the rack, and the necessity for close accuracy in cutting this rack to take care of the long travel is obvious.



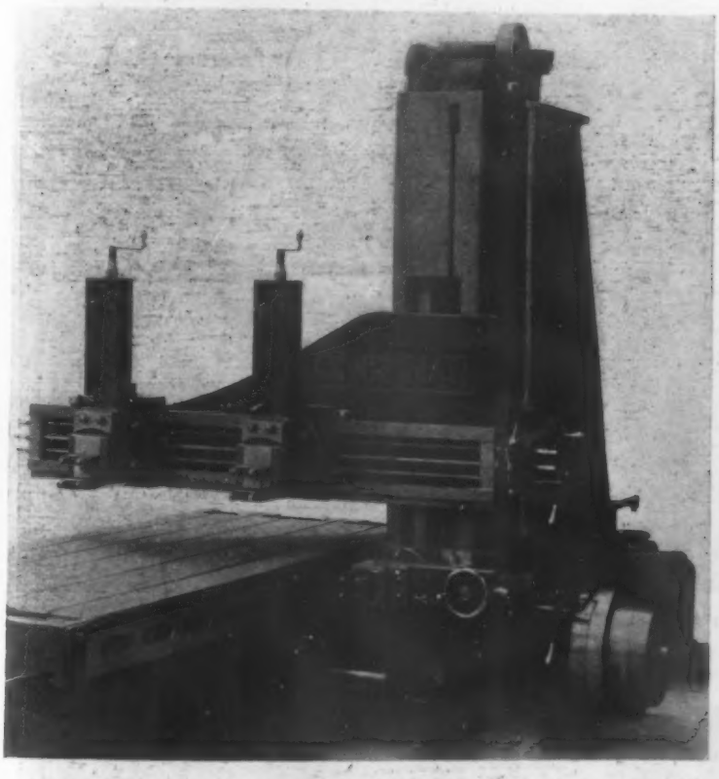
Close Accuracy in Cutting the Rack Is Feature of Gage

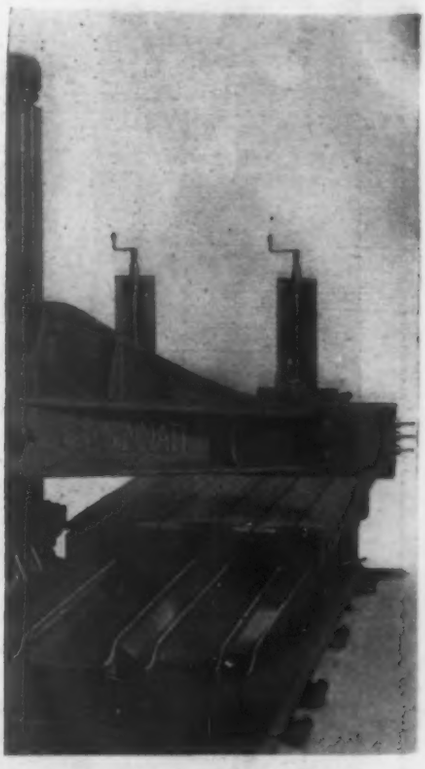
A course of seven lectures for superintendents, foremen and others associated with industrial plants, has been mapped out by the Baltimore Safety Council, of which Paul F. Stricker is director. The first will be given on Dec. 14, by John A. Oartel, director of safety for the Carnegie Steel Co., Pittsburgh. His subject will be "Why Safety Work Pays." The other lectures are: Jan. 4, "The Design and Construction of Safeguards," F. S. Benedict, Norwich Wire Works, Providence; Jan. 18, "Safety as a Community Asset," A. S. Goldsbough, general secretary, Merchants and Manufacturers Association, Baltimore; Feb. 1, "Where You and I Fit in the Promotion of Safety Work," Frank E. Morris, Liberty Mutual Insurance Co., Boston; Feb. 15, "Organizing the Industry for Safety;" Feb. 29, "Plant Conditions, Arrangement, Order, Lighting, Sanitation," E. S. Chapin, Pennsylvania Railroad, Philadelphia; March 14, "The Foreman, the Keystone of Modern Industry."

Open-Side Planer With Three Ways

A special planer having a bed with three ways, two vees and one flat, as shown in the accompanying illustration, has been built recently by the Cincinnati Planer Co., Cincinnati. In this machine the box table has five T-slots for clamping purposes and is also equipped with a table clamp and inner guides to prevent lifting or tilting of the table out of the track. Forced lubrication is provided for all of the ways, a reversible pump forcing the oil into the ways directly under the tool. To prevent dirt from getting into the ways provision is made for straining the oil before it is recirculated.

The rail is of the extended type and is designed to take the strains when cutting at the extreme end. The knee is of the same outline as the rail and is bolted and doweled securely. For clamping against the column large T-slot blocks, which are the full length of the knee bearing, are employed, a construction intended to assure maximum stiffness of the knee and rail.





Special Planer Equipped With Bed Having Two Vee and One Flat Ways. The bed construction may be noted from right hand view

The heads, which are equipped with rapid power traverse in all directions, are unusually long so that they may be used to plane with the cutting edge of the tools some distance below the rail.

With this construction it is claimed that the slide will have full bearing on the harp at all times and that the down-feed screw is always in tension. The rail is equipped with power elevating device for raising and lowering, and a limit stop is provided to prevent the rail from being raised beyond its maximum height. The column is braced and ribbed on the inside in a manner intended to prevent distortion. In addition to being bolted and dowelled to the bed, a large tongue cast integral with the bed fits a groove in the column, which further provides against its moving.

Power rapid traverse is provided for the side head to permit it to be raised or lowered by the pulling of a lever to engage the traverse mechanism. The slide is equipped with a hand wheel which is claimed to be a more convenient means for hand adjustment of the side head slide, particularly when reaching to the extreme inside limit of its travel.

Brinell Numbers, for Non-Ferrous Metals, Which Are Comparable

With a view to drawing attention to the desirability of authors expressing Brinell numbers for non-ferrous metals in figures that may be comparable, Dr. H. W. Brownson, in a paper, "Brinell Hardness Numbers," presented at the annual fall meeting of the Institute of Metals in Manchester, England, Sept. 11, said that this is not a difficult matter, seeing that the desired result is obtained if balls and loads are used for which the ratio $\frac{L}{D^2}$ (the load in kilogrammes divided by the square of the ball diameter in millimeters) is constant. In the past this simple expedient appears to have been neglected by a large number of authors. Dr. Brownson quotes some 14 different values for $\frac{L}{D^2}$ to be found in the pages of the *Journal* of the Institute. Unfortunately the numbers found with one ratio for $\frac{L}{D^2}$ are not convertible to the numbers that would be given using a different ratio, since the differences in Brinell numbers not only vary with the value of $\frac{L}{D^2}$ but are also different for different metals, and again different for the same metal in various degrees of hardness.

A diagram is given showing some of these differences for copper, 97:3 copper-zinc and 70:30 brass. The only solution of the difficulty lies in agreeing upon some one ratio for $\frac{L}{D^2}$ to be invariably used for one class of alloys, and the author suggests that the choice for the large group of copper alloys with Brinell hardness numbers from about 40 to 200 should rest between the ratio as standardized in the United States and the ratio which is favored in some quarters in Great Britain.

The paper constitutes a plea to put Brinell numbers in line with other scientific data so far as their value for comparative purposes is concerned.

Czecho-Slovakia's Great Steel Works

Diversified List of Outputs of Finished Products of Witkowitz Plant—Installation Changes Effected Since the War —More Than 25,000 Men Employed

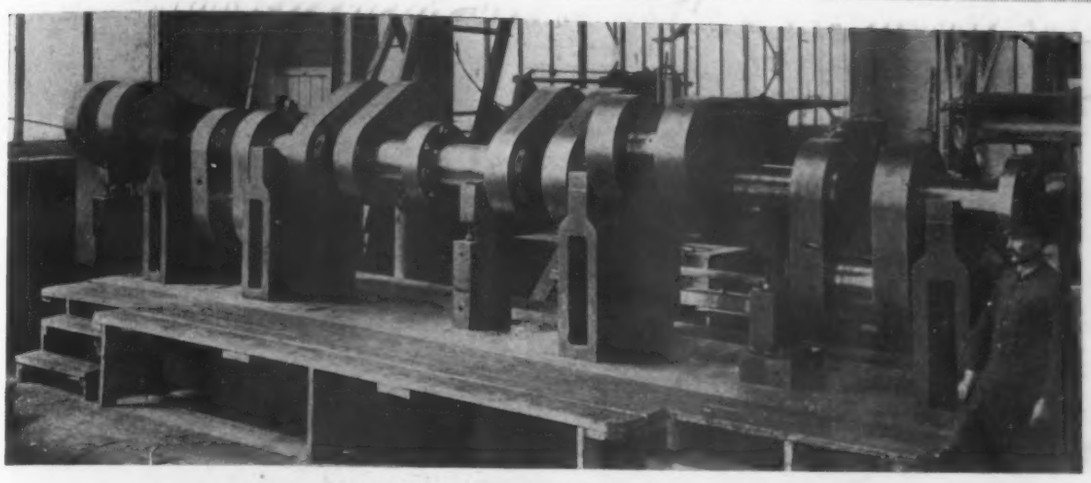
BY CAPT. GODFREY L. CARDEN

IN the past summer, I am informed, the Witkowitz works were working about 26,000 men. In February last, when I visited this plant, the number was 14,000. The Ruhr occupation accounts largely for the increase.

Witkowitz is one of the largest iron and steel plants in all Europe and one of the most modern in layout and equipment. The full name and address are Witkowitz Mines, Steel & Ironworks Corporation, Witkowitz, Moravia, Czecho-Slovakia. In the general scheme of

(Above) New Rolling Mill With 280-Mm. (11-In.) Continuous Roughing and Finishing Stands

(Below) Stern and Rudder Frame of a Single-Screw Steamship With Rivet Holes Ready for Attaching of the Side Plating of the Hull



Crank Shaft of Six Throws, Coupled at Center

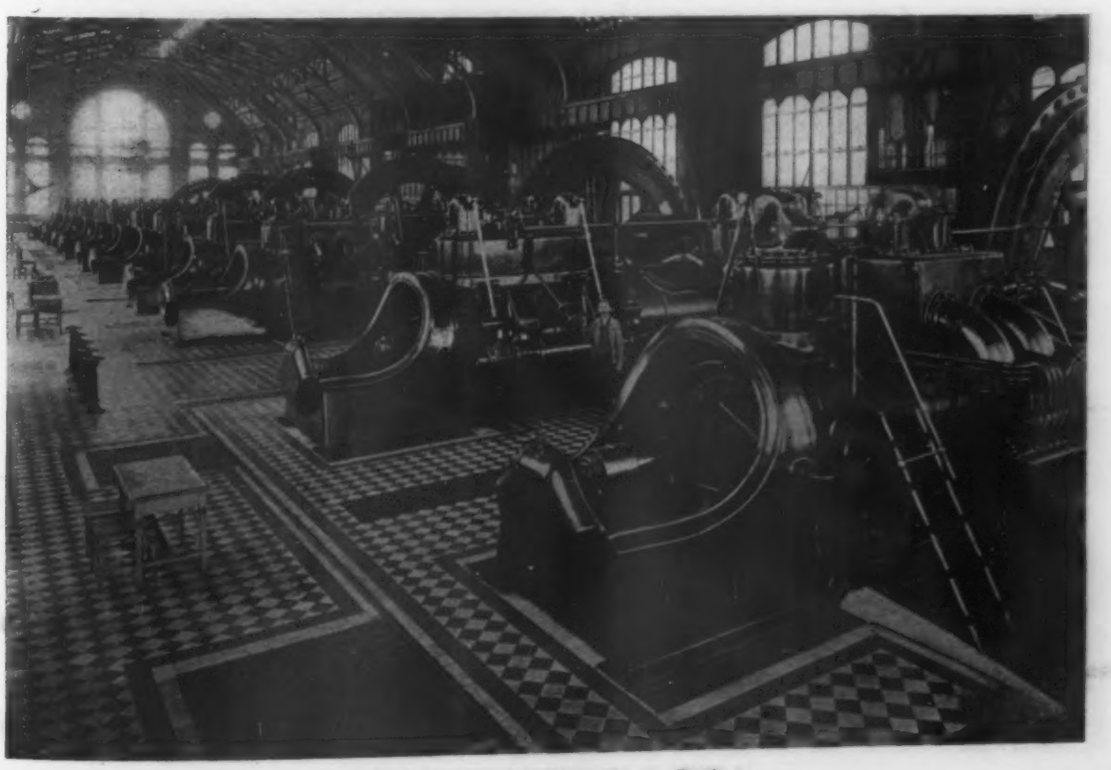
production the works resemble the Krupp works at Essen, but differed from Krupp before the war principally in the fact that gun construction was not undertaken. Heavy gun forgings were produced, but in the main these forgings were worked up by the Skoda works.

While Witkowitz was an Austrian establishment during the war, the Versailles Treaty has included it in Czecho-Slovakian territory. The armor plant, always an important part of its equipment, remains intact. While the Essen shops have undergone a marked change since the war, as described in a previous article in THE IRON AGE (March 15, 1923) the Witkowitz changes have been along the lines of expansion rather than the taking on of new production.

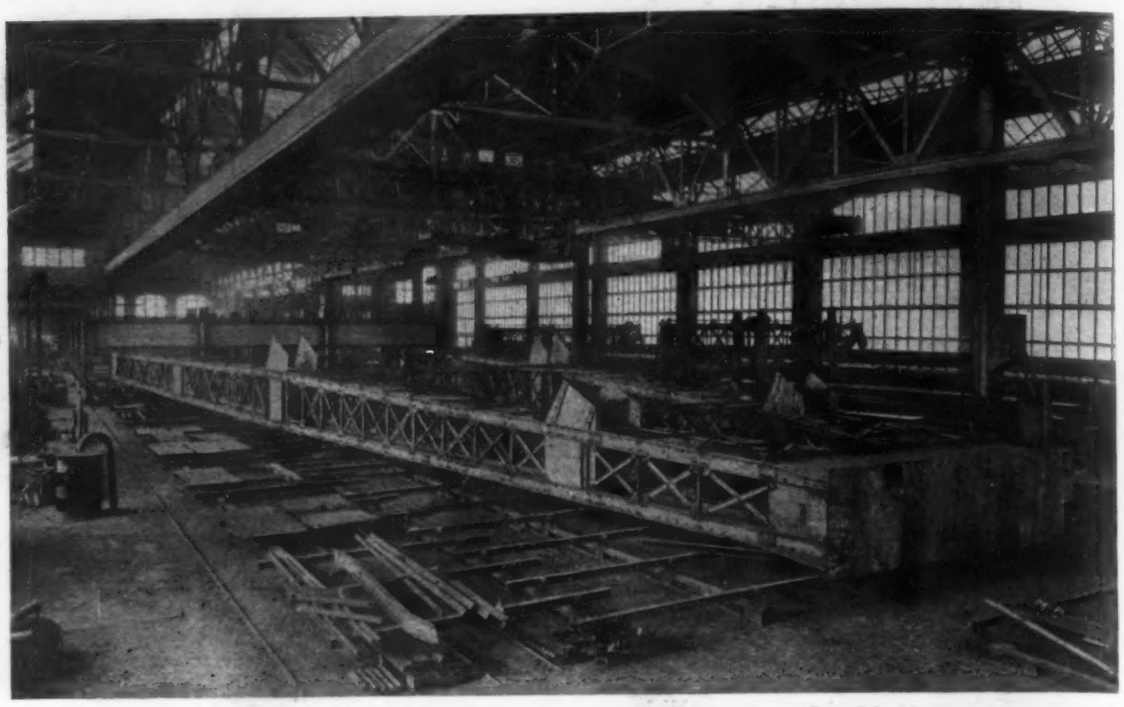
Now, as before the war, output embraces pig iron for castings and open-hearth steel, cast iron parts, steel castings for machinery and for shipbuilding, nickel steel of all kinds, wheels for locomotives and tenders, crucible steel ingots, boilers, bridges and construction work of all description, plates of largest size, including armor plate, plates and sheets from 2 mm. (No. 14 gage) upward, blooms, billets, slabs, skelp for tube manufacture, material for weldless tubes, rods, flat, broad and universal iron, cold rolled material, girders (I-beams) up to 500 mm. (19⅝ in.) height of web, railroad material of all kinds, solid drawn tubes, pipes, fireproof bricks and tiles, and complete plant installations for mines, foundries, coke and gas works.

My observations are based on a two-days' inspection, for which the first director, Dr. Ing. J. Puppe, whose writings on rolling mill practice are well known in the United States, accorded every facility. The works are the property of S. M. von Rothschild and Gebrüder Gutmann, of Vienna, and are in charge of General Director Dr. Techn. A. Sonnenschein. I hardly recognized the plant, which I had previously visited in August, 1909. The expansion has been very great and, in February, when work was slack, Dr. Puppe was taking advantage of the lull to tear down old structures and carry out new building programs. Since my previous visit I found that many new plants had been erected, mainly the following:

1. New steel works and rolling mill.
2. Mannesmann tube rolling mill.
3. Cold rolling mill.



Gas Engines in Central Power Station

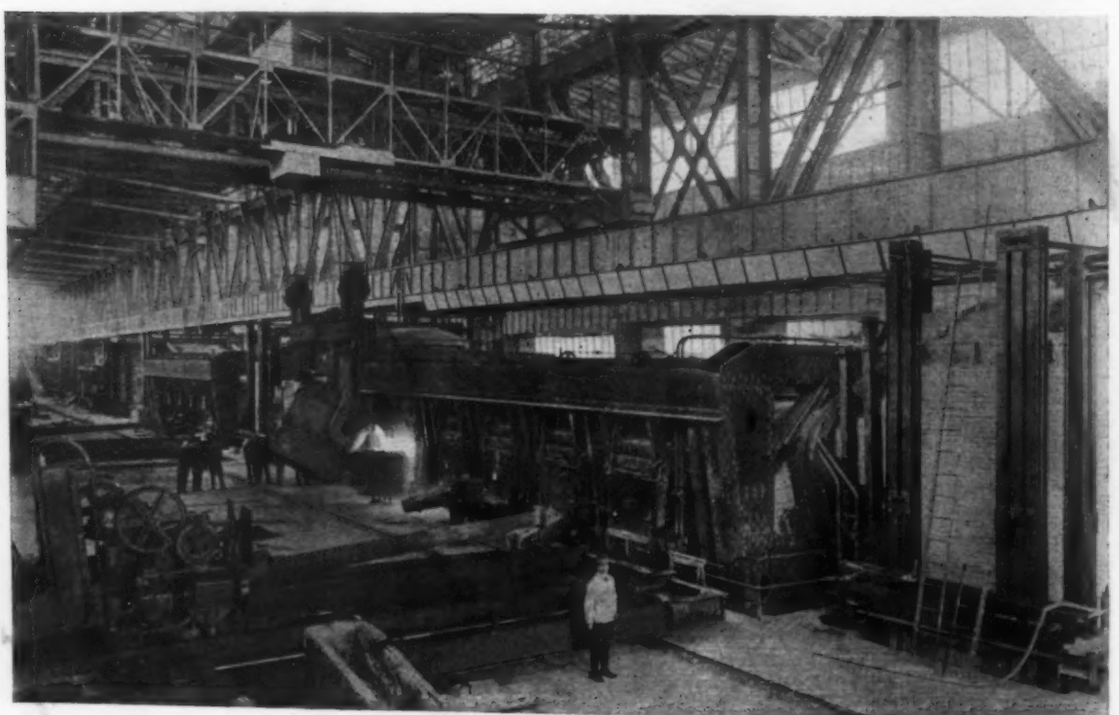


Fabricating a Bridge Tower

4. Electric power stations Nos. 3 and 4.
5. Foundry for heavy castings up to 100 tons.
6. Two mechanical shops for steel castings and forgings.
7. Railroad car wheel workshop at the engineering works.
8. Bridge building shops.
9. Boiler shops.
10. Press work department.
11. Coking plant of 86 ovens.
12. Benzol plant.
13. Dwight-Lloyd ore dust agglomerating plant.
14. Loading plant for ores.
15. Electric pumping plant at the Oder River.

In addition to the foregoing there was in course of construction a gas holder for the waste gases of the blast furnaces, with a normal capacity of 50,000 cu. m. (1,765,000 cu. ft.) and a maximum by telescoping of 100,000 cu. m. (3,530,000 cu. ft.). Further expansions are represented in the building of a fourth blast furnace at Sofienhütte and the development of the company's private railroad to a length of 147 km. (91 miles) of full gage track.

In 1909 the blast furnaces were divided into two groups—one at Witkowitz proper and a second at Sofienhütte. There were seven furnaces and 30 Cowper stoves, eight blowing engines driven by steam and three



Charging Floor in Open-Hearth Department, Showing Pouring of Liquid Metal into One of the Three 200-Ton Tilting Furnaces. The two charging machines shown have pivoted carriages, permitting the piel to be swung to any desired horizontal angle

Pressure Tank Work

by gas. Spathic and brown iron ores were obtained then as now from upper Hungary. Swedish magnetite and apatite were also brought in, lixiviated copper pyrites and manganese ore from Bosnia, Bukovina, Hungary, and other countries.

Large Dependence on Talbot Furnaces

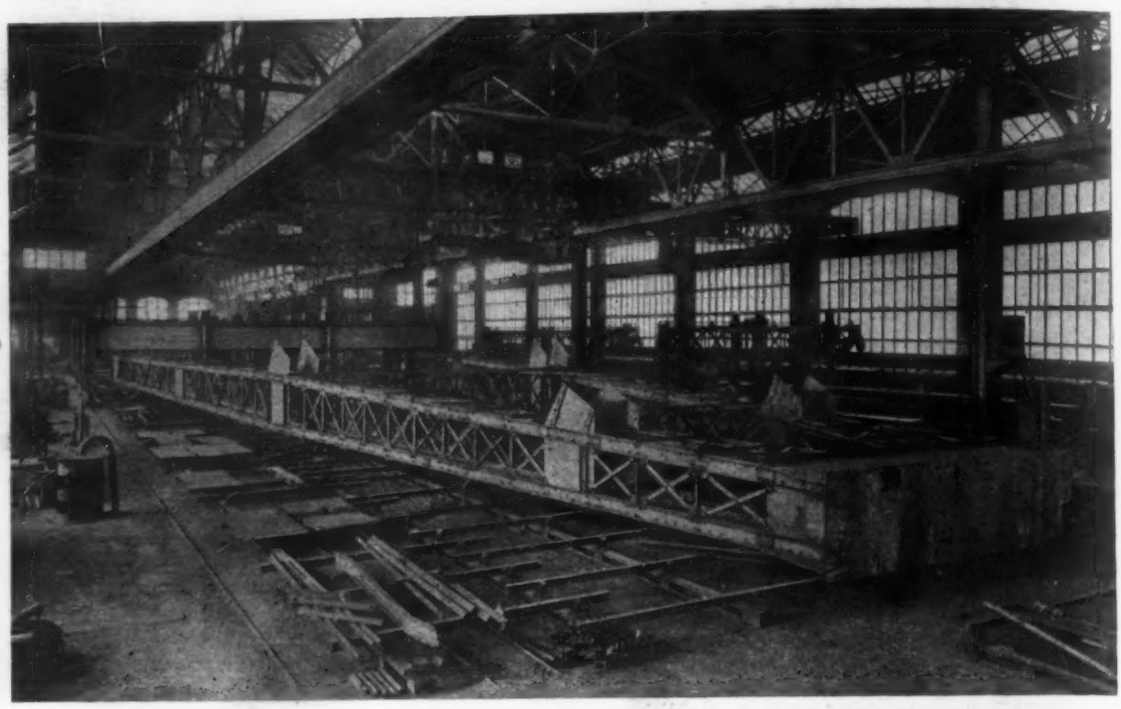
During the war Witkowitz turned out as high as 1400 tons of projectiles and other material a day. This output was secured from 22 open-hearth furnace heats averaging 63 tons each. The peak was reached with 24 heats of 63 tons each, but this record was beaten in May last when one day's output was 29 heats of 63 tons each, or 1827 tons. This production was obtained from three (of the four) Talbot furnaces of 200 tons each, one Talbot mixer of 300 tons, one tilting furnace of 60 tons and three Siemens-Martin furnaces of 60 tons capacity.

During my visit the Talbot furnaces were working with 65 per cent of liquid basic pig iron and 35 per cent of scrap. With these charges the average daily output of one Talbot furnace covering a period of a month was 300 tons; the maximum was 315 tons. The composition of the charges was governed by the scrap market and the price of basic pig iron. For a time the plant was compelled to melt in the Talbot furnaces 80 per cent of scrap with only 20 per cent of liquid pig iron. The daily production of one Talbot furnace under this régime was 250 tons. During the war a Talbot mixer was operated, of about 300 tons capacity, but after the war this mixer, which did not differ in construction from the Talbot furnaces except that its walls were not so thick, was operated the same as the other tilting furnaces. The production of the 60-ton tilting furnace is 220 tons per day, and of each stationary furnace, 180 tons per day.

Dr. Puppe informed me that he found he could do with the Talbot furnace all that was required for steel making at Witkowitz; in fact, he did not hesitate to say that if he had to rebuild the works, or to build another steel plant working the same material as now, he would install only Talbot furnaces.

In addition to the new steel works, which were erected between 1911 and 1914, and enlarged in 1915, there are two other steel plants with seven Siemens-Martin furnaces, one with two and the other with five furnaces, of capacity ranging from 12 to 35 tons. The production of these plants includes steel castings, forgings for machinery and shipbuilding, crucible and special steels, axles, tires, locomotive wheels, car disk

Armor Plate Turn-Over Table, in the New Rolling Mill Department

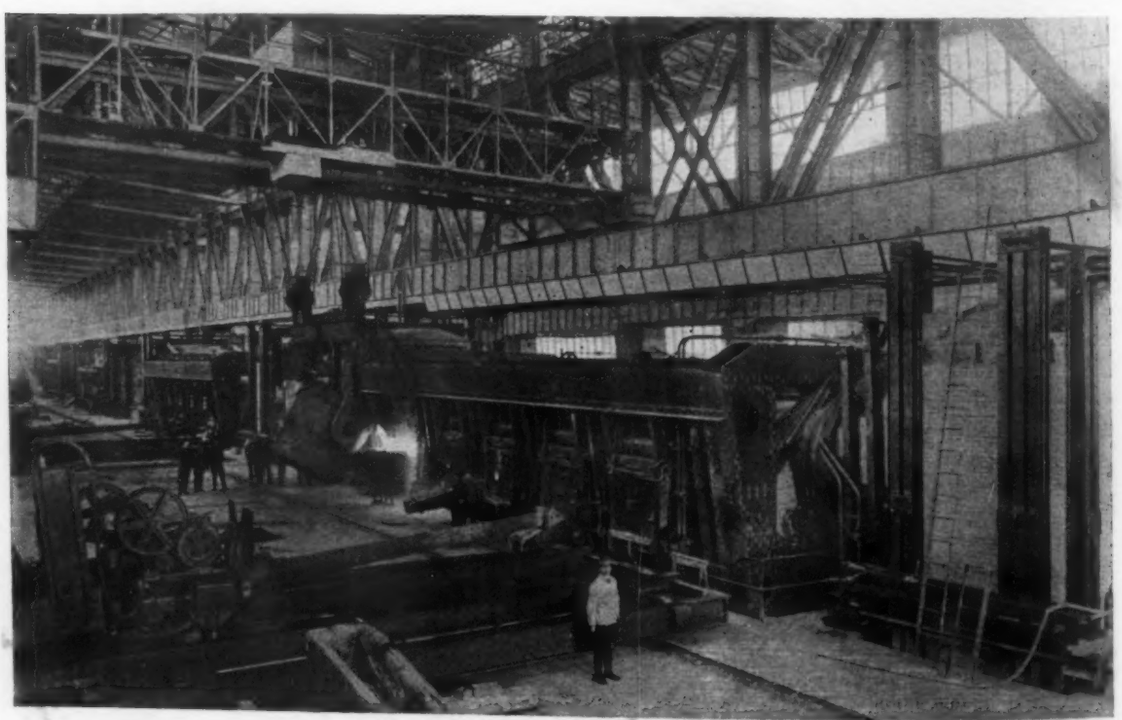


Fabricating a Bridge Tower

4. Electric power stations Nos. 3 and 4.
5. Foundry for heavy castings up to 100 tons.
6. Two mechanical shops for steel castings and forgings.
7. Railroad car wheel workshop at the engineering works.
8. Bridge building shops.
9. Boiler shops.
10. Press work department.
11. Coking plant of 86 ovens.
12. Benzol plant.
13. Dwight-Lloyd ore dust agglomerating plant.
14. Loading plant for ores.
15. Electric pumping plant at the Oder River.

In addition to the foregoing there was in course of construction a gas holder for the waste gases of the blast furnaces, with a normal capacity of 50,000 cu. m. (1,765,000 cu. ft.) and a maximum by telescoping of 100,000 cu. m. (3,530,000 cu. ft.). Further expansions are represented in the building of a fourth blast furnace at Sofienhütte and the development of the company's private railroad to a length of 147 km. (91 miles) of full gage track.

In 1909 the blast furnaces were divided into two groups—one at Witkowitz proper and a second at Sofienhütte. There were seven furnaces and 30 Cowper stoves, eight blowing engines driven by steam and three



Charging Floor in Open-Hearth Department, Showing Pouring of Liquid Metal into One of the Three 200-Ton Tilting Furnaces. The two charging machines shown have pivoted carriages, permitting the piel to be swung to any desired horizontal angle

Pressure Tank Work

by gas. Spathic and brown iron ores were obtained then as now from upper Hungary. Swedish magnetite and apatite were also brought in, lixiviated copper pyrites and manganese ore from Bosnia, Bukovina, Hungary, and other countries.

Large Dependence on Talbot Furnaces

During the war Witkowitz turned out as high as 1400 tons of projectiles and other material a day. This output was secured from 22 open-hearth furnace heats averaging 63 tons each. The peak was reached with 24 heats of 63 tons each, but this record was beaten in May last when one day's output was 29 heats of 63 tons each, or 1827 tons. This production was obtained from three (of the four) Talbot furnaces of 200 tons each, one Talbot mixer of 300 tons, one tilting furnace of 60 tons and three Siemens-Martin furnaces of 60 tons capacity.

During my visit the Talbot furnaces were working with 65 per cent of liquid basic pig iron and 35 per cent of scrap. With these charges the average daily output of one Talbot furnace covering a period of a month was 300 tons; the maximum was 315 tons. The composition of the charges was governed by the scrap market and the price of basic pig iron. For a time the plant was compelled to melt in the Talbot furnaces 80 per cent of scrap with only 20 per cent of liquid pig iron. The daily production of one Talbot furnace under this régime was 250 tons. During the war a Talbot mixer was operated, of about 300 tons capacity, but after the war this mixer, which did not differ in construction from the Talbot furnaces except that its walls were not so thick, was operated the same as the other tilting furnaces. The production of the 60-ton tilting furnace is 220 tons per day, and of each stationary furnace, 180 tons per day.

Dr. Puppe informed me that he found he could do with the Talbot furnace all that was required for steel making at Witkowitz; in fact, he did not hesitate to say that if he had to rebuild the works, or to build another steel plant working the same material as now, he would install only Talbot furnaces.

In addition to the new steel works, which were erected between 1911 and 1914, and enlarged in 1915, there are two other steel plants with seven Siemens-Martin furnaces, one with two and the other with five furnaces, of capacity ranging from 12 to 35 tons. The production of these plants includes steel castings, forgings for machinery and shipbuilding, crucible and special steels, axles, tires, locomotive wheels, car disk

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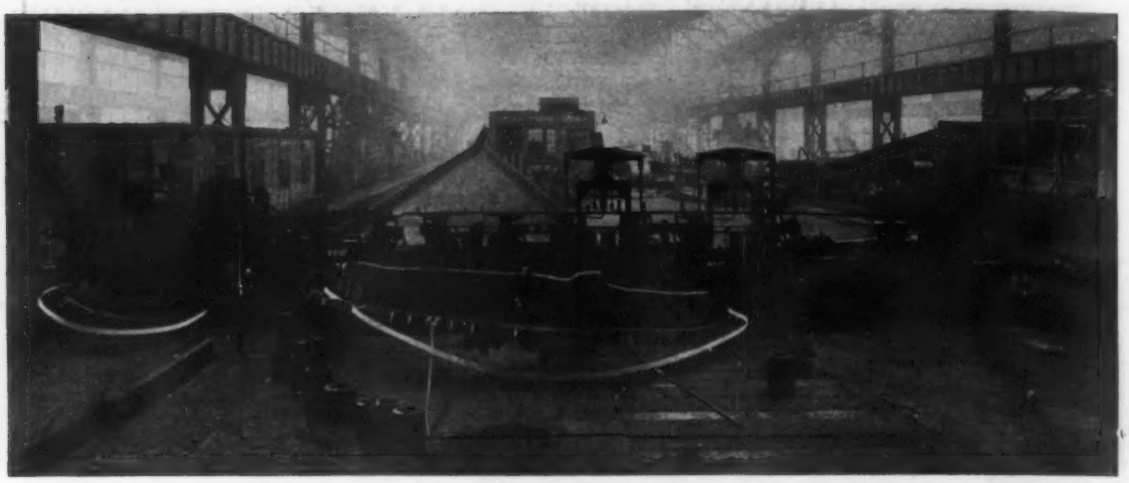

Looping Mill Rolling Band Steel

wheels cast or forged, war material, boiler end plates and pressed plates.

Annual steel ingot capacity amounts to 450,000 tons in the new works and 150,000 tons in the two older plants, or a total of 600,000 tons. The slag can be put down at about 90,000 tons per year, the greater part of it being worked over in the phosphate mills and reduced to phosphate powder.

Witkowitz must export 70 per cent of its capacity in order to run full; Czecho-Slovakia cannot absorb, it is declared, more than 30 per cent. Before the war, when the works were in Austrian territory, the output was largely absorbed in the dual monarchy. Today it needs only the temporary suspension of German custom duties to enable the German works east of the Ruhr to take full advantage of Moravian steel.

The new steel works, erected since the beginning of the war, are located 2½ km. (1½ miles) west of the old plant; the total ground covered amounts to 160,000 square meters (39 acres.) In addition to the four Talbot furnaces and four 60-ton furnaces, there are two furnaces of 4 tons capacity each for the melting of ferromanganese. Hot metal is brought from the blast furnaces in ladle cars of 30 tons capacity to the charging floor of the open-hearth department, where the car is lifted by crane to a spout on the charging side of the furnace. Ore, lime, scrap, etc., are handled by four charging machines. The high-phosphorus slag flushed from the charging side of the furnace is carried away by a narrow-gage car. The tapping of the charge is made in four ladles of 65 tons capacity.

In addition to the four charging machines there are, on the charging side of the furnace, two 50-ton traveling cranes. The tapping side has three traveling ladle cranes of 80 tons each, and one traveling crane of 50 tons capacity, the track for which lies above the track of the three ladle cranes. This tapping pit has the highest roof in the steel works, the height being 30 m. (98 ft.) and length 278 m. (912 ft.).

Generating Gas

Producer gas for the furnaces is made in a central generating plant built for the new steel works. In addition, the furnaces receive gas from the coke plants located in Witkowitz and Mahrisch-Ostrau, through an underground pipe line 4 km. (2½ miles) long. The gas is stored in a newly installed gasometer of 5000 cu. m. (176,500 cu. ft.) capacity. The central gas producing plant consists of 27 producers of 2600 mm. (8½ ft.) diameter. Each has a gasifying capacity of 16 tons of pit coal in 24 hr. The coal is transported by two cranes.

In connection with each producer is a gas cleaner 3500 mm. (11½ ft.) in diameter. The main gas channel leading from under the cleaners is divided by partitions, so that each steel furnace can be supplied with gas from its own producer group, and arrangements have been made whereby the separate groups of furnaces can be joined up.

Steam for the gas producers is obtained from boilers supplied with the waste heat of the Talbot furnaces. These boilers have a heating surface of 650 sq. m. (7000 sq. ft.) and are fitted with superheaters and economizers. The supply here is such as to furnish hot water for the entire plant. The actual output per day per Talbot furnace is 310 tons steel and 5500 kg. (12,000 lb.) steam per hr. from each heating boiler. These boilers are constructed on the Garbe system.

Steam from the heating boiler is used for the steam consumption of the 39 gas producers in the new steel and rolling mill plant. The surplus steam of 18 atm. (265 lb. per sq. in.) that cannot be used in the gas producers will be taken by a turbine, now in erection, for electric power. As a result of experience, it is intended to equip all furnaces with waste-heat boilers. The production of steam from all furnaces of the new steel works will be great enough not only for the 39 gas producers, but also to generate electric power in a turbine. It is intended in this way to obtain 40 per cent of the electric power necessary for the drives of the rolling mills, cranes, etc., in the new works.

As a side line, the new steel works has a lime furnace with a working capacity of 90 to 100 tons of lime per 24 hr. There is also a dolomite plant equipped with two hauling furnaces, each of which produces 25 tons of burnt dolomite per day. There is also a basic and acid mill for quarry work.

Reheating Furnaces

Ingots are transported hot by a small track to five reheating furnaces under floor, which are installed in a separate building between the steel works and the rolling mills. There are three stripping cranes for charging the ingots into the gas-fired furnaces, where they remain 45 to 90 min. After being reheated, the ingot is placed on a tilting chair, as usual, and thence rolled through the blooming mill.

Rolling Mills

Probably as fine as any that can be found on the Continent, the new rolling mills have automatic recorders installed for practically every phase of work performed. These telltale graphs are scanned by the works manager periodically, so that he is able to determine accurately just what performance is going on. All rule of thumb and haphazard method is eliminated, every stage of the work being reduced to mathematical exactness.

The rolling mills comprise: One 1000-mm. (39⅜ in.) blooming, one 4.5-m. (177-in.) armor plate mill, one 3.2-m. (126-in.) coarse plate two-high mill, one 2.3-m. (90-in.) plate three-high mill, one 1.8-m. (71-in.)

(*Concluded on page* 1553)

MECHANICAL ENGINEERS MEET

Urge Federal Tax Reduction—Demand for Engineering Activity in Politics

Endorsement of Secretary Mellon's tax reduction plan was unanimously voted by the council of the American Society of Mechanical Engineers at its meeting in New York, Dec. 3. W. S. Finlay, Jr., New York, vice-president of the American Water Works & Electric Co., speaking at length for the motion, emphasized among other things that "The average engineer's only capital is represented by his brains and his energy. Every year he draws down on this reserve fund of vitality, but an examination of the Treasury regulations fails to disclose any depreciation allowance on this account."

The society is holding its annual meeting this week. The first formal session, Monday evening, was given over chiefly to the presentation of the presidential address by John L. Harrington, consulting engineer, Kansas City. The election of officers for the ensuing year was announced, and a diploma and medal was presented to Past President John R. Freeman, Providence, in recognition, particularly of his contributions to the problems of fire prevention, and to Frederick A. Halsey for his wage payment studies dating from the eighteen-nineties. The list of officers has already been given in these columns. The new president is Fred R. Low, editor of *Power*.

Need of Engineer in Politics

Mr. Harrington in his address declared that "False social ideals are hampering industry and the dominance of the lawyer is retarding political development. Apparently it is expected that the native American, with his superior cultural education, will make his way by his wits without soiling his hands. Engineers know these conditions and know their detrimental effect upon men and upon the economic welfare of the country. It is their obligation to present the truth and to press for the reform of our educational system to conform to it.

"The employer is not to be blamed," he continued, "if he demands that the door be opened to foreign labor when he finds it impossible to satisfy his requirements at home. We have seen the building trades throttled, our housing needs unsatisfied, by the extravagant labor costs resulting from restriction in training and apprenticeship so severe that these crafts will almost die out with the present generation of workmen."

"Our country is still governed by the military and the legal professions, influenced somewhat by the business man," added Mr. Harrington. "Every president, except Harding, has been a general or a lawyer, while the latter not only occupies his peculiar field, the judiciary, but dominates in the legislatures and in the executive branches of the Government. These facts have materially retarded the progress of political development, for the lawyer lives by precedent. His eyes are always upon the past. It results that we progress slowly, that order and rule are deemed more important than service and progress. The engineer with his constructive, creative, scientific mind is sorely needed."

Prizes Awarded

Announcement of awards of prizes was made yesterday. Prof. John Airey, University of Michigan, received a life membership for a treatise on "Art of Milling." The society's junior prize went to S. S. Sanford, Detroit, for his paper on "Elasticity of Pipe Bends." One student prize was bestowed upon Charles F. Olmstead, Minneapolis, for a paper on "Oil Burning for Domestic Heating," and another to Herbert E. Doolittle, San Diego, Cal., for a paper on "The Integrating Gate," a device for gaging in open channels.

Graphical Study of Journal Lubrication

Two papers presented at the general session Dec. 4, although more or less of the nature of progress reports of the scientific investigations, were actively discussed.

One of these was by H. H. S. Howarth, general manager and chief engineer, Kingsbury Machine Works, Philadelphia, presented under the title of "A Graphical Study of Journal Lubrication." The hydrodynamic theory of lubrication, first developed by Osborne Reynolds and subsequently simplified by W. J. Harrison, forms the basis of the exposition. An attempt is made, in the paper, to express the theory in a way that will be easily applicable to the solution of practical problems. The paper visualizes the characteristics of the oil film and the pressures within it for a journal completely surrounded by its bearing. The influences of clearance and viscosity upon the journal friction were quantitatively shown by means of a chart that can be used for designing bearings. Examples solved by means of the chart were given. A few of the characteristics of the journal partially surrounded by the bearing were also shown by curves. It was stated that the study of partial bearings is not as yet completed.

There were eleven separate discussions of the paper, four of which were written. Questions regarding the lubrication of locomotive crankpins were asked by W. Elmer, Pennsylvania Railroad, Altoona, Pa. In reply to several criticisms that the paper was too scientific for use in solving lubrication problems in a practical way, Mr. Howarth pointed out that the paper covered only the beginning of an investigation which will at the end be compared with practical results as determined by means of testing machines.

"Stress Distribution in Rotating Gear Pinions as Determined by the Photoelastic Method" was a paper by Paul Heymans, Massachusetts Institute of Technology, and A. L. Kimball, Jr., research laboratory General Electric Co., Schenectady. The paper presented further results of the scientific study undertaken by the General Electric Co., for the development of better electric railway motor pinion and outlined the continuation of the work started and reported upon before the Society last year. The work described was performed at the Massachusetts Institute of Technology. Its object was to find out the effect of rotation of a pinion on maximum stress for different speeds of rotation. It was emphasized that the results given are from preliminary observations.

Mr. Kimball explained the photoelastic method and with the aid of lantern slides described the apparatus employed in the test. The maximum tensile stresses occurring at the root of the tooth in mesh have been measured for different speeds. From the table and chart of results shown it was to be noted that there is an increase in maximum stress due to rotation, amounting to nearly 100 per cent increase for a speed of 1250 r.p.m. Active discussion followed the presentation of the paper, centering for the most part on factors to be taken into account as the test proceeds.

Robert Sibley, vice-president of the society from San Francisco, presided at this session.

A paper on the bending and torsion of multi-throw crankshafts on many supports, by S. Timoshenko, research department Westinghouse Electric & Mfg. Co., East Pittsburgh, was read by title.

Increase in Dues Proposed

At the business meeting Dec. 4, a motion was carried to submit to the membership a proposed change in the constitution permitting an advance in dues to $20 for member, associate, and associate-member grades. The annual report of the council revealed that the present membership of the Society is in excess of 18,000. Several standards, read by title, were approved.

Other sessions held Dec. 4 included a joint session with the American Society of Refrigerating Engineers; a session under the auspices of the textile division and the fluid meters session, which was an open meeting for discussion of Part II of the report of the special committee on fluid meters. A public hearing on power test codes for stationary steam generating units and for locomotives was held.

The outstanding features of the machine shop practice management and other sessions to be held Dec. 5 and 6 will be reported in a forthcoming issue of THE IRON AGE.

Nominating Committee

A committee to nominate officers for 1925 was appointed in accordance with the rules, thus to give the committee plenty of time to ascertain sentiment in the

membership and to make a final selection calculated to provide the best timber available. The officers just elected were chosen by a nominating committee of a like period of existence. The committee will include William R. Webster, Bridgeport Brass Co., Bridgeport, Conn.; Kingsley L. Martin, New York; Charles Loeber, Richmond, Va.; R. G. Nye, Buffalo Steam Pump Co., North Tonawanda, N. Y.; William M. White, Allis-Chalmers Mfg. Co., Milwaukee; E. W. Burbank, Allis-Chalmers Mfg. Co., Dallas, Tex., and Bruce Lloyd, of Henry Lund & Co., San Francisco. The alternates are respectively as follows: R. Sanford Riley, Worcester; John H. Lawrence, New York; L. P. Hood, Washington; James Guthrie, Cleveland; W. S. Reed, Indianapolis, and Wynn Meredith of Sanderson & Porter, San Francisco.

EXPORT TRADE QUIET

Manchuria Buys 22,000 Tons of Rails—Japanese Merchants Buy in Europe—Russian Buying Rumored

NEW YORK, Dec. 4.—Inquiry from foreign markets is light. The few Japanese merchant orders that are current are, according to reports, being secured by Continental sellers. The Chinese market is quieter. Importers of iron and steel believe that it may be possible to sell Continental rails in the United States, in small quantities, as a result of delayed deliveries here, but European prices are still too high to permit of profitable transactions. The South Manchuria Railway Co., which has awarded the 70 miles of 100-lb. rails (about 11,000 tons) recently inquired for, to Suzuki & Co., New York, has placed a duplicate order with the Mitsubishi Shoji Kaisha, European office, which was divided between Belgium and France at a price delivered Japan, said to be about 10 per cent under the American quotation.

The only inquiry of any size reported current from Japan is for parts and materials for the construction of locomotives. Although anxious to import as much material as possible before March 31, 1924, when duties on iron, steel and other material are again imposed by the Imperial government, dealers are evidently confining their present purchases to a price basis, until the position and range of activities of the government as a competitor in iron and steel is completely known. In some quarters it is believed that there is a possibility of an extension of the period of free imports of certain commodities.

Rumors of extensive inquiries and purchases in the United States by Russia continue. It is stated by importers that no aluminum is being offered for export by French makers, and with German production at a low ebb, there is no immediate prospect of imports of the foreign product into this country.

CONDITIONS IN ENGLAND

Serious Effects of the War Still Felt—New Developments in Steel

Roy G. Davis, general manager Firth-Sterling Steel Co., Pittsburgh, who recently returned from a trip to Sheffield, England, when asked what he had observed in regard to industrial conditions in England, said:

"In Sheffield the steel manufacturers state that the steel requirements of the English shipbuilding industry are the backbone of the steel business. The Washington disarmament agreement has practically stopped the building of ships for naval purposes. However, there is at present considerable interest in the bidding for the construction of two battleships which are allowed by the Washington agreement.

"When the war ended, it left more than a necessary number of merchant ships and the acquisition of certain German vessels has more than supplied the after war requirements. Opinions were expressed that the manufacturing conditions in England would have been improved if the German merchant ships had been destroyed and shipping requirements supplied by the building of new ships.

"One large shipyard on the Clyde was visited where very little work was in progress; in fact, they were building only one medium sized merchant ship. These conditions prevail throughout the ship-building industry and this has naturally been a hard blow to the steel industry.

Many Out of Employment

"At the present time, in Sheffield, there are between 25,000 and 30,000 men out of employment. These men are receiving doles from the Government at the minimum rate of 25 shillings per week. Probably among the unemployed there are a number who are glad to continue in idleness at the Government's expense, but the large majority would be glad of an opportunity to work.

"The world war took a large number of young men in the formative period of their lives before they had obtained training or experience in productive work. During the five years since the ending of the war, they have not had the opportunity of getting this experience and idleness in the meantime has not helped toward proper development. One of the problems which England must face when business becomes better is the training and assimilation of these young men.

Most Heavily Taxed

"At the present time the English people are probably more heavily taxed than any other people in the world, but they seem to be meeting these conditions with optimism and approval of the efforts of their Government in reestablishing their credit and in paying their indebtedness. They are doing everything possible to economize and it is only after close observation one is able to note a difference in their living conditions as compared with what prevailed before the war.

"This influence of economy has had a marked effect on the development of their automobiles, which are of light weight, low horsepower, with high speed motors, giving about 50 per cent better economy than obtained with the average American cars. The motorcycle has developed along the same lines as the automobile; that is, toward light weight and economy of operation. For a week in the month of October, a motorcycle show was in progress in London and it was a surprise to note the large number of English manufacturers making motorcycles. However, indications point to more interest in automobiles and it would not be surprising to see a development of the automobile in England somewhat paralleling its development in the United States. A moderately priced and well made English car is now being placed on the market with results that indicate a potential market.

"In personal conversation, the Englishmen are in full sympathy with France and her troubles. Looking at the problem, however, from the broad viewpoint, they point out that other policies are necessary under the present conditions.

Stainless Steel for Turbine Blades

"Probably the most interesting development in the steel business is the progress which Sheffield has made in the development and application of stainless steel. New applications of this material are being continually made and stainless steel has proved itself to be the greatest development in steel since the discovery of high speed steel. It is being used more and more for general engineering purposes and has been adopted by practically all the turbine manufacturers in England and on the Continent for turbine blades. Large quan-

tities of it are being used not only for land turbines but also for marine turbines and the results which have been obtained are far and away better than any material which has been previously used.

"Stainless steel cutlery has supplanted the ordinary cutlery steel to a large extent and at the present time probably three-fourths of all cutlery manufactured in England is of stainless steel."

LUXEMBURG MARKET DEPRESSED

Profit Dwindles as British Coal Is Purchased—In October 27 Blast Furnaces Active

LUXEMBURG, Nov. 22.—Prices, which appeared to be a little firmer during the last few days of October, since the beginning of the month have declined slightly. It seems to be generally believed that the October firmness was a result of the increase in receipts of Belgian coal. Fear of encountering German competition in foreign markets has led some plants to quote low prices without, however, attracting the attention of buyers. This weakening of quotations has been reflected in the condition of the Luxemburg plants to such an extent that there is today practically no margin between cost and selling prices. Decline of the market seems to have ceased for the past few days and the last movement of exchange contributed to a slight revival of business. Fairly large orders have been placed but plants are so short of tonnage that this had no effect on prices. The rise of the pound sterling has an immediate unfavorable effect on costs, as most of the plants, unable to secure necessary supplies of coke from Belgium and the Ruhr, are forced to buy large tonnages from Great Britain. These purchases of foreign cokes will, however, permit an increase in production and one or two furnaces are to be blown in shortly.

Oct. 31 there were 27 furnaces in blast in Luxemburg. Production in October was as follows: Pig iron, 133,979 tons, of which 129,638 tons was basic. Steel ingots, 126,378 tons, of which 123,801 tons was Bessemer steel.

The following prices are quoted in Belgian currency and pounds sterling per metric ton:

	Fr.	
Cast iron, No. 3.....	430 to 435	$20.00 to $20.25
Ordinary Bessemer ..	420 to 425	19.50 to 19.75
Bessemer billets	620	28.80
Largets	650	30.25
Beams	£7 5s. to £7 7s. 6d.	31.46 to 32.02
Bars	7 12 6d. to 7 15	33.10 to 33.63

American Puddled Iron Co. Plans

YOUNGSTOWN, Dec. 4.—Active preparations are being made to begin operations in Warren at the new plant of the American Puddled Iron Co., subsidiary of the Youngstown Steel Co. It will produce mechanically puddled iron after a process developed through many years by E. L. Ford, a prominent Valley steel maker. The plant at Warren is located on a site of 418 acres and represents an expenditure of $2,100,000. It will have an initial capacity of 250 tons per day of muck bars, billets, slabs, blooms and sheet bars.

The Youngstown Steel Co. is now offering through underwriters $1,100,000 of 7 per cent convertible preferred stock, to provide funds for the American Puddled Iron Co. The financing will give the subsidiary concern a working capital of $600,000 with no debts. Mr. Ford is chairman of the board of directors, while R. C. Steese, formerly prominent in the Brier Hill Steel Co., is president and treasurer.

A lapweld mill in the tube mill complement at East Youngstown, Ohio, of the Youngstown Sheet & Tube Co., is being changed over into a buttweld unit. Increased demand for merchant pipe in the smaller sizes is responsible for the change, state officials. The Sheet & Tube company has also authorized two buttweld pipe mills for its Chicago property, while the Republic Iron & Steel Co. likewise plans an additional buttweld unit at its Youngstown property. The Sheet & Tube company is also installing a number of new threading machines at its pipe mill department in East Youngstown.

BIDS REJECTED

Navy Will Scrap Four Battleships—Makes Two Awards

WASHINGTON, Dec. 4.—Claiming that bids opened last Friday for the three battleships at Philadelphia and the one at Boston were too low, the Navy Department yesterday decided to scrap these ships itself and will cut the steel to size and sell it later. The ships at the Philadelphia yard are the Michigan, Minnesota and Kansas. The one at the Boston yard is the Delaware. Estimates of the Philadelphia yard, submitted by Capt. W. P. Robert, and of the Boston Navy Yard, submitted by Capt. C. M. Simmers, will, it was declared, based on the most recent price received by the Navy for armor and scrap steel, yield approximately $170,000 more for these vessels than if they were sold at the highest bids received.

The other two vessels for which bids were opened, the Vermont and Nebraska, were awarded to the highest bidders, Learner & Rosenthal, Oakland, Cal. These vessels are at the Mare Island, Cal., Navy Yard. The accepted bid for the Vermont was $41,110 and that for the Nebraska was $37,110. The awarding of contracts to scrap these six battleships disposes of all vessels that came under the treaty limiting naval armaments.

Weirton Steel Co. Made Record Production of Ingots Last Month

A world's record production of steel ingots from a plant of its size was made by the Weirton Steel Co., Weirton, W. Va., last month, when 50,431 gross tons were produced from seven open-hearth furnaces of a rated capacity of 100 tons. This showing compares with 49,300 gross tons, the best previous record, made by Weirton Steel Co. in March, 1922. Last month's output was made without any departure from the regular practice of this plant, except that the scrap charge was 2 per cent less than the amount hitherto used. Producer gas was the fuel. This plant has made more than 45,000 tons in a month several times in the past year.

All mills of this company were engaged at 90 per cent of capacity in November and it is not expected that operations will drop below 80 per cent during this month. The new sheet mill of the company, consisting of eight hot and four cold mills, which started early in October, now is running full.

"The Oxygen Lance in Blast Furnace and Steel Plants" is the title of an interesting booklet recently issued by the Linde Air Products Co., 30 East Forty-second Street, New York. It is evidently one of a series on the application of oxygen in major industries. It is brief, consisting of only 17 pages, and opens with a description of the oxygen lance itself, followed by the application of this lance to the blast furnace such as opening an iron notch, opening a slag notch, reopening frozen tuyeres, drilling salamanders, etc. This is succeeded by a description of the application of oxygen in steel plants, particularly in open-hearth furnaces where oxygen is used in opening the tap hole and also in opening frozen stoppers in steel ladles. The booklet closes with a short discussion on pipe layouts for furnace plants. There are several illustrations and the phraseology is of such a nature that it can be easily understood by the man in the mill.

Hearing in Bethlehem-Midvale Merger Case at Buffalo

BUFFALO, Dec. 4.—Hearings by the Federal Trade Commission on the Bethlehem-Midvale merger were resumed here yesterday after an adjournment taken last Wednesday. Examiner George McCorkle presided.

The same character of testimony that has marked previous sessions was developed at yesterday's session. The first witness was Morgan A. Dunne, secretary and treasurer of the Archbold-Brady Co., Syracuse. While Mr. Dunne's testimony was along the lines of preceding witness as to conditions prior to and since the merger, he would not commit himself to an expression as to the effect of the merger on his business. He did testify that unusual fluctuation in prices had occurred since July 1 this year.

On direct examination the witness stated that prior to the merger 90 per cent of his company's structural steel requirements was purchased from the Lackawanna Steel Co., but in 1921 a considerable portion of steel needs was purchased from the Bethlehem Steel Corporation. This change was made because the Lackawanna mills were not rendering sufficient service, he stated.

The hearings here will occupy another week, attorneys for the commission state.

Improvement of Nickel Plating on Steel

A program of nickel plating experiments is being undertaken by the Bureau of Standards with a view to finding the best possible process for making protective coatings on steel. A large number of specimens of steel are to be plated, and the procedure will be varied from the standard conditions in many different ways in order to test the effect on the product of these variations. After plating the specimens will be subjected to tests to determine their resistance to corrosion and to other adverse conditions that nickel plated ware is expected to meet. A few other tests will be made with nickel plating on brass and other metals in order to learn to what extent the results found for steel are generally applicable to other metals. From six months to a year will probably be required for the tests. The program is being carried out in cooperation with the advisory committee of the American Electroplaters' Society. Cold rolled steel is to be used for all the tests, as it is considered desirable to have them all made on one material and when completed, the deposits will be examined both directly and under the microscope. They will be tested for hardness, for their adhesion to the steel under such adverse conditions as bending, rolling, etc., and for the resistance they offer to corrosion under various conditions of exposure, both indoor and outdoor.

Appeal to Shareholders of Atlas Steel Corporation

In a letter to shareholders, directors of the Atlas Steel Corporation, Dunkirk, N. Y., urge them to take up their proportionate share of a $3,000,000 issue of 8 per cent cumulative stock, half of which is now being offered. It is declared that proceeds of the offering will put the company on a sound financial basis and enable it to continue operations.

"The directors and officers will do all in their power to save the corporation, but they cannot and will not do it without the support and participation of the stockholders," reads a letter issued on the subject, to shareholders. "If this attempt fails, the officers and directors will have performed their full duty toward all stockholders and there will be no escape from a liquidation of the corporation's affairs by its creditors, in which event, in the opinion of directors, the present outstanding stock will have no liquidation value."

Creditors have agreed to make long extensions of their claims in event the current financing proves successful.

It is pointed out that for the 12-month period ending Oct. 1, 1923, the company showed a net profit of $328,964, despite the handicap of insufficient working capital. Directors state officially it is their opinion that with a fair degree of general prosperity the corporation can work out of its present position and be successful.

Chairman Johnson to Introduce Immigration Bill in House

WASHINGTON, Dec. 4.—Indicating the efforts that will be made to enact immigration legislation at the session of Congress which was begun yesterday, Chairman Johnson of the House Committee on Immigration has prepared a measure which would change the basic year from 1910 as at present to 1890 and change the quota from 3 per cent to 2 per cent. The present law, unless extended, expires on June 30 of next year. The Johnson bill, which appears to have strong support in Congress, also would divide the immigrants into two classes, close blood relatives and other aliens. It is maintained by Mr. Johnson that the bill he has introduced will provide a system so that only desirable immigrants will be permitted to enter the United States. The measure would exempt parents and children of American citizens, students, ministers, and those in the learned professions. Husbands, wives and children of aliens with first papers would be admitted without regard to quota limitations upon application of the aliens. Immigrants proposing to come to the United States would be required to fill out a questionnaire obtained from American consuls along the lines recommended by Secretary of Labor Davis. Other members of Congress also are proposing immigration legislation.

Conference on Cast Iron Pipe Specifications

The subject of standard specifications for cast iron pipe was discussed at a meeting of a special committee of the American Engineering Standards Committee, Oct. 4, 1923, at the Engineering Societies Building, New York, as a result of which it was voted that the special committee should recommend "that the American Engineering Standards Committee call a representative conference on bell and spigot and flanged cast iron pipe and fittings, to consider the development of specifications covering dimensions and materials." This action resulted from a review of two sets of specifications for cast iron pipe submitted for the approval of the A. E. S. C., one by the American Gas Association and the other by the American Society for Testing Materials.

When the special committee examined into the advisability of giving to either or both of these specifications the status of American Standard, it was found that neither of the specifications seemed to satisfy completely the needs of all interests concerned in the establishment of such standards. After thorough discussion of all phases of the situation, the vote was taken to defer approval of the cast iron pipe standards already in the field, pending consideration of the subject by a conference fully representative of all having an interest in the subject. As a result of the committee's recommendations, the chairman of the A. E. S. C. was authorized, at its meeting on Oct. 11, to call the conference as outlined.

German Manganese and Chrome Ore Imports

German imports of manganese ore to Aug. 1 this year had been much less than a year ago. For the first seven months this year the total was 56,395 tons as compared with 170,801 tons to Aug. 1, 1922. Of the total this year 30,194 tons came from India and 13,385 tons from South Russia. Chrome ore imports into Germany this year to Aug. 1 had been only 3532 tons as compared with 16,189 tons for the same seven months last year.

J. H. Hopp, vice-president Charles C. Kawin Co., Chicago, will deliver an address before the Chicago Foundrymen's Club, Saturday evening, Dec. 8. The subject will be "Comparison of Physical and Chemical Control in the Reduction of Foundry Losses."

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ESTABLISHED 1855

THE IRON AGE

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What Is Annealing?
What Is Tempering?

FOR over a year a group of committees from our large engineering societies have been discussing the nomenclature of heat treatment. They have been struggling with such questions as "What is annealing?" "What is tempering?" unfortunately without any prospect of reaching an agreement.

Nevertheless such an attempt is very much worth while. These questions are far from academic. Editors, of course, would be pleased to have precise definitions in their dictionaries, but makers and users of steel would be spared many annoying errors if each knew precisely what the others mean by the words they use.

Not so many years ago, when the softening of cold worked sheet or wire was about the only commercial heat treatment done (except the work of the blacksmith and the armor plate maker) one or two terms were all that were necessary for general conversation. More precise words and phrases used inside closely guarded shops became a local idiom or argot. But heat treatment is no longer a secret. Laboratory investigations and shop practices are published and discussed at length. The art has grown amazingly widespread. Nearly two million tons of alloy steel is being made annually in the United States, and its proper utilization depends upon closely controlled heat treatments, often quite complex. Some standardization of terms is therefore quite necessary, not only that specifications may be unambiguous, but that engineer, laboratorian and heat treater may not continually have to stop and say: "Normalized steel. Oh, yes! Now, what do you mean by 'normalized'?"

And the effort of these committees is timely. Some usages should be changed before they become more firmly fixed. For instance, aluminum foundrymen say they "temper" duralumin or alloy 17S when they heat it to 950 deg. Fahr. and cool it in boiling water. But this treatment (followed by short ageing) *hardens* the alloy; it is precisely equivalent to quenching a carbon steel from 1600 deg. Fahr. in brine. The same kind of internal changes are produced in each alloy and each is very much harder, stronger and less ductile than before. Yet the aluminum men have adopted a term for hardening which means a softening, toughening treatment to the steel man.

Apparently it is such questions as this that prevent joint action. Shall the definitions refer to the operation, or to the results to be obtained? Shall tempering refer to a mild heating followed by a moderately slow cooling, or shall it refer to some treatment — any treatment — that softens and toughens? If the former, the aluminum men are within the definition; if the latter, they could hardly miss it further.

One might almost doubt that it will be possible to bring such divergent views to a common meeting ground. If a sincere attempt fails, the next best thing is for some society with a powerful following to take the lead and publish its own definitions. As with the Automotive Engineers' system of numbering steel, they may not be perfect, but they will be very useful. If the work is based on sound premises, these definitions will acquire increasing vogue.

Remember the definition of steel. The late Dr. Henry Marion Howe spent a lifetime delving into the riddle, "What is steel?" He discovered thousands of facts; he kept informed of researches in all lands; he wrote volume after volume. When it came to defining steel, he used a long chapter of 13,000 words, classifying all the kinds of steel that have been made since the dawn of history. Unfortunately the result was a catalogue and not a definition. Yet Dr. Howe's own life work had established the necessary scientific facts to prove without question that steel is a malleable alloy of iron and iron carbide!

It is to be hoped, therefore, that the committees at work on nomenclature of heat treatment will not disband because unanimous agreement is lacking, or because it is impossible to be exhaustive in a definition compressed to a dozen words. They will do a great work if they give us some concise definitions for major operations, leaving something for adjectives to do in fixing the meaning more precisely.

THE recovery of the Belgian iron and steel industries since the war has been phenomenal. The pig iron output recently came up close to the pre-war rate and this has been done with fifteen fewer blast furnaces than in 1913, a good many

furnaces having been replaced with units of greater capacity. In steel even a better record has been made. In the last month for which there are official figures, more steel was produced than in any month since the war and the monthly average for either 1912 or 1913 has been exceeded. One authority describes the industry as "healthy, solid and flourishing." In exports also an interesting record has been made, their volume being considerably larger than before the war, the increase being due in part, to be sure, to the economic union with Luxemburg. The striking fact, however, is that Belgian exports have exceeded each month this year the total steel exports of the United States, though the little kingdom has a steel-making capacity hardly larger than is found in the Pittsburgh or the Chicago district.

Steel Exports at Low Ebb

WITH a record this year in pig iron and with steel production coming close to the record of 43,600,000 tons, it might be expected that our steel exports would at least equal those of normal peace times. However, thus far only a little more steel has been exported each month than in 1922, and the rate has been about 18,000 tons per month less than in the remarkably lean year 1921, at the same time lagging far behind 1913. The actual figures are 162,800 tons per month to Nov. 1 this year, as compared with 161,500 tons per month in 1922, with 181,000 tons per month in 1921, and with 241,000 tons per month in 1913.

Of further interest is a comparison with the British record in the same periods. For the first ten months of this year British exporters sent out more steel than in any year since the war, and indeed have fallen but 11 per cent short of the pre-war rate. To Nov. 1 this year, British exports have been 367,000 tons per month, exceeding by a comfortable margin the averages for the last three years—283,400 tons per month in 1922, 141,700 tons in 1921, and 270,900 tons in 1920. In 1913 British steel exports were 414,100 tons per month. While the British export rate thus has risen to about 88 per cent of the pre-war volume, our exports have fallen to about 67 per cent, with the proportion of the output exported the smallest in years.

As in 1913, domestic demand is the controlling factor here and the foreign market is secondary. While American exports have been declining, those of the British have been advancing. Even Belgium's record exceeds and that of France almost equals our own. The present domestic situation is favorable to an absorption of our greatly increased capacity, but the time is not far distant when a greater export business will be necessary. To secure this, however, lower costs will be essential, for the competition of European steel producers will increase rather than diminish.

THE 1923 imports of metallic tin at over 13,065,480 pounds per month to Oct. 1 already have exceeded the record of any year in the last ten. The figures are one index to the heavy demand for tin plate, although large quantities of tin are used in bearing metals, in solder, and in other ways. If the present rate is maintained for the last quarter, the year's imports will exceed those of the peak year 1917 by about 13,000,000 pounds. Besides heavier consumption, another factor in this increased movement is the shutting down of domestic refineries which had contributed about 1000 tons per month, or 26,880,000 pounds each year, to American consumption.

Inconsistency in the Scrap Market

THE course of the scrap market in the past two or three years — referring chiefly to the market price of melting steel scrap in the consuming centers—has been rather inconsistent with the accepted theory that as the steel industry grows older scrap becomes a more important commodity. It ought to fluctuate less and less as time passes, but the fluctuations in the past two or three years have been particularly wide.

From 1900 to 1910 the production of basic open-hearth steel ingots and castings was exactly sextupled, rising from 2,545,091 tons in 1900 to 15,292,329 tons in 1910. During that decade there was much concern lest the expansion in the use of the process should be hampered by a scarcity of scrap. The outcome of old material could not be expected to increase with anything like the same rapidity, while the Bessemer process, responsible for much works scrap, turned downward in point of tonnage after 1906.

Those early fears have proved groundless quite largely. Open-hearth steel can be made with little scrap, even with no scrap in a pinch, but the outcome of scrap relative to the current production of steel naturally tends to increase, because steel production does not have so great a percentage increase from year to year as formerly, and also perhaps because steel does not stay in service so long as formerly. At any rate, the automobile is a conspicuous case of a short life for steel.

That scrap is always going to be in requisition, will always have a consuming market, can be taken for granted. Scrap, and particularly heavy melting steel, is very easy to store. An important part of the cost of scrap, delivered, is made up of freight charges, which are not to be expected to fluctuate as commodity markets do. Considering all these factors, one should reasonably expect that market prices for scrap should fluctuate less than they used to do. If there had been steady market prices in the past two or three years it is certain that a very rational explanation for the steadiness would be presented and would everywhere be accepted.

The scrap market of late has not conformed to any such theory. One may ignore the statistical record of 1920, which was rather a weird year all around; but from the low point in 1921 to the high point in 1923 prices nearly tripled. In more recent history, the average decline in heavy melting steel scrap at Philadelphia, Pittsburgh and Chicago from the top last March to the recent low level was about $11 a ton, or between 40 and 45 per cent. Before the war the advances and declines were considerably less in point of percentage and of course much less still in point of dollars per ton.

The explanation of the inconsistency seems to be that users simply have not exercised in the case of scrap the judgment they bring to the forming of

policies in respect to other materials. When manufactured goods advance, men begin to think they may be going too high, and when they decline they finds an equalizing point. When scrap is advancing, everyone turns in to help it advance, and when it declines, everyone helps it to go lower. Not until something breaks is the market permitted to trend toward an equilibrium.

Paying Workers by Check

REPEATED hold-ups of paymasters carrying large sums of money have led to much discussion of the advisability of paying workers by check instead of in cash. Some firms have recently put the check system into effect, usually because they themselves have been victims of robberies of this character. Metropolitan Boston has suffered severely, and as a consequence President Clifford S. Anderson of the Associated Industries of Massachusetts has appointed a committee to make searching investigation of the check method.

Scattered over the country are plants in which employees have been paid by check for years. In these particular cases the system has proved satisfactory to the owners and presumably to the employees. But others have tried it and abandoned it. After the panic of 1907 the extreme scarcity of currency made paying by check a necessity, and many houses continued it after the emergency had passed. But finally most of them gave it up.

One of the reasons would not apply today. Then was the day of the open saloon, and it was found that a large per cent of the checks were cashed by saloonkeepers, as a matter of good business, because men stayed on and spent some of the cash they had received in exchange for the slip of paper. In some cities, where the saloons were controlled by commissions, rules were made which put a stop to this practice, but elsewhere such restriction could not be made. This condition, of course, is a thing of the past.

The storekeepers did not like the check system, for they felt obliged to accommodate their customers, which involved carrying large amounts of currency. The banks did not like it, for the additional bookkeeping required added to their payrolls. But the real reason for the return to the pay envelope and cash was because the workers themselves disliked to handle checks. To cash them was troublesome. Some of them did not like to take others into their confidence as to the amount of their earnings. The average industrial employee carries no checking account and is not in the same position as the salaried man.

In adopting the check system today the employer should consider carefully the means available to his employees for converting their pay checks into cash. If a bank has a branch close by the gates the problem is simplified. But men and women have little idle time as a rule during banking hours, and unless the visit to the bank can be made conveniently in the noon hour they are often compelled to resort to the storekeeper or landlord.

The automobile has made highway robbery easier and safer than it used to be, especially in remote districts. Where paymasters have to travel lonely stretches of country, payment by check may be well worth adopting. But in most cases the remedy lies in better precautions against robbery rather than in a change to the check system.

Upkeep of Equipment

MACHINERY is much better cared for than it used to be, in well-managed American shops and factories. The "repair crew" no longer exists in the old sense. The maintenance department now goes on the theory that "a stitch in time saves nine;" consequently so much of its work is along preventive lines that the real old-time repair job, the breakdown of a machine, is far less common. The cost of enforced idleness of equipment and operators has declined accordingly. It has been said that a maintenance department may become self-supporting, even if its labor is classed as "non-productive."

Some machine breakdowns cannot be prevented, notably those which result from the carelessness or unskillfulness of the operator. But these are now a small minority. In the high class machine shops the operators themselves are usually good mechanics and able to keep their machines in the best running form, or at least to recognize trouble and report it. But in plants in which quantity production prevails, and most of the machines are of special type, operatives as a rule are not mechanics. They notice nothing until the machine goes wrong, or a working light goes out, or a belt begins to slip.

Inspection and the making of running repairs do not end here. Belts are watched closely in order that machinery may receive ample power but with no waste. Electric wiring is looked over where there is motor drive, that short-circuiting may not cause a shutdown. Lighting fixtures are inspected. Minor equipment, such as ladders and trucks, receives a looking-over at times. Where white paint is used to improve illumination it is kept white. Dirt is not permitted on window panes. The maintenance men should have an eye out for safety devices, too, not only to repair these if need be, but also to replace them if operators remove them to get higher production on piecework jobs.

An important factor in the system is fixing responsibility. A breakdown means an investigation. If the operator is to blame, that is one thing. If the maintenance men should have prevented the trouble, the case is quite different. They are held responsible not only for preventing the direct losses referred to, but also those which idle equipment adds by throwing production out of balance.

Source of Manganese Ore Imports This Year

Manganese ore imports into the United States by countries of origin, as reported by the Bureau of Foreign and Domestic Commerce, were as follows to Oct. 1, this year, in gross tons:

Brazil	74,098
Turkey in Europe	24,837
British West Africa	20,135
British India	13,352
Russia in Europe	11,670
Argentina	4,053
Turkey in Asia	3,005
England	1,106
Panama	400
Chile	384
Germany, China, etc.	130
Total	153,170

The large quantity coming from West Africa is interesting, as well as that from Turkey.

MAKES NEW RECORD

Production of Pig Iron in November by Furnace of Trumbull-Cliffs Company

A new high record for production of pig iron for one month was made last month by the furnace of the Trumbull-Cliffs Furnace Co., Warren, Ohio. This furnace, which has a rated capacity of 600 tons a day, or 18,000 tons a month, actually produced 25,303 tons, or a daily average of 840 tons. The previous record, also held by this furnace, was a daily average of 754 tons. This furnace, which is jointly owned by the Cleveland-Cliffs Iron Co. and the Trumbull Steel Co., supplies hot metal to the latter company, which came close to establishing a new high record production mark last month. In spite of an accident, which caused the suspension of one open-hearth furnace for several days, the plant, consisting of seven 100-ton furnaces, produced 49,098 gross tons of ingots, an average of 7372 tons.

The blast furnace also made a record for a day. The largest production during any one day was 915.85 tons. During four days in succession the output exceeded 900 tons. The iron was made from ore only, no scrap being used.

During November the total ore mix charged in the furnace was 47,765 tons. Of this 30.13 per cent was hard crushed ore, 8086 tons from the Republic mine and 6305 tons from the Cliff Shaft mine. Mesabi ores made up 37.38 per cent of the charge, 6514 tons coming from the McCook mine and 11,339 from the Boeing mine. The remainder of the charge, or 30.28 per cent, was old range non-Bessemer ore, and included 12,080 tons from the Stephenson mine and 2396 tons of manganiferous ore. Included in the charge was 2.18 per cent mill cinder, 98 tons of this being puddle cinder and 947 tons open-hearth cinder. The ore burden contained 52.6 per cent metallic iron, which theoretically should give a yield of about 56 per cent of pig iron. However, the actual pig iron yield was 52.7 per cent. Beehive coke was used for fuel and it required 1970 lb. of coke and 942 lb. of limestone per ton of iron. Flue dust made amounted to 233 lb. per ton of iron, 60 per cent of which was sintered and used. The remainder was recharged direct with the ore. No off grade iron was made during the month.

Bolt, Nut and Rivet Standardization

The American Engineering Standards Committee has just approved the personnel of the committee which is developing standards for bolt, nut and rivet proportions under the sponsorship of the Society of Automotive Engineers and the American Society of Mechanical Engineers. This working committee, which numbers a total of 43 members, 17 of whom represent producers, 24 consumers, and 2 general interests, is divided into 8 subcommittees, dealing with the following specific subjects:

Large and small rivets,
Wrench head bolts and nuts,
Slotted head products,
Track bolts and nuts,
Carriage bolts,
Special bolts and nuts for agricultural machinery,
Body dimensions and material,
Nomenclature.

The chairman of the sectional committee is Prof. A. E. Norton of the mechanical engineering department of Harvard University and the secretary, W. J. Outcalt, of the standards department of the General Motors Corporation, Detroit. There are twenty trade and technical societies and groups included in the organization of the committee.

Iron and Steel Production in Canada

In its report dealing with the production of pig iron in Canada for the month of October, the Dominion Bureau of Statistics states that the output was somewhat lower than that of the previous month at 73,598 long tons, compared with 75,216 tons in September. The average monthly production for the ten months ending with October was 76,000 tons and the total production during this period reached 758,194 tons, an increase of 142 per cent over the output for the same period in 1922, and an increase of 50 per cent over the production for the corresponding period in 1921, when the quantities produced were 312,877 tons and 506,730 tons respectively. The entire output of basic pig iron for the month under review amounted to 40,986 tons, or a decline of 11 per cent from that of September; this iron was made entirely for further use of companies reporting. Foundry iron made for sale remained about the same at 17,377 tons and malleable iron made for sale increased about 37 per cent, to a total of 15,235 tons. The number and location of active furnaces at the end of the month were unchanged.

The total production of steel ingots and castings in Canada during October amounted to 67,496 tons, or an increase in all grades amounting to 1,162 tons over the output in September, when 66,334 tons were reported.

Canadian Pig Iron Prices Advanced After Active Buying

TORONTO, ONT., Dec. 3.—The recent decline in the price of Canadian pig iron had the effect of bringing many of the larger melters into the market for iron covering requirements for the first quarter of 1924, and it is stated that Ontario furnace operators disposed of extensive tonnages of foundry and malleable iron at the low figure of $27.05 per ton, Toronto. As a result of the heavy demand for iron at the low price, producing interests have again revised prices, this time the increase amounts to $2 per ton above the former low level. The demand has now fallen off. Seven furnaces are blowing out of a total of twenty in the Dominion. Prevailing pig iron prices are as follows: No. 1 (2.25 to 2.75 silcion) $29.05; malleable, $29.05; No. 2 (1.75 to 2.25 silicon) $28.05; Toronto. Montreal prices are No. 1 and malleable, $31.90; No. 2, $30.90; Summerlee and Carron $30 to $32.

Wage Increases Halted

Under the above title the New York State Industrial Commissioner traces the wage increases reported over the middle six months of the year in a total of 1648 representative factories in the State. Of these 346 factories were devoted to metals, machinery and conveyances. The wage increases in this group were as follows:

April, 69 factories with 28,367 employees affected; May, 64 factories with 25,989 employees affected; June, 38 factories with 4384 employees affected; July, 27 factories with 3476 employees affected; August, 9 factories with 3790 employees affected, and September, 9 factories with 1528 employees affected. There has thus been a steady decrease from beginning to end of this period in the record of wage increases reported.

A. A. Alles, Jr., Fawcus Machine Co., Pittsburgh, was elected president of the Industrial Cost Association at a recent meeting of the directors in Pittsburgh. Mr. Alles took an active part in the founding of this organization and was its first secretary. R. B. Holmes, National Fireproofing Co., and George W. Sheridan, West Leechburg Steel Co., were elected vice-presidents, C. W. Garrison, Sutton Press, secretary-treasurer, and James P. McLean, Pittsburgh Forge & Iron Co., assistant secretary-treasurer. A. D. Lowdermilk, Standard Seamless Tube Co., was elected a director. The chairman of the Pittsburgh section is G. W. Dudgeon, Standard Underground Cable Co. National headquarters are to be transferred from New York to Pittsburgh.

NOVEMBER IRON OUTPUT

Decline from October 5110 Tons Per Day —Rate Lowest of the Year

Seventeen Furnaces Down or Banked and Three Blown In—Net Loss of Fourteen

The decline in pig iron output, which started in June, and has been uninterrupted since, was further emphasized in November. According to THE IRON AGE'S regular monthly statistics, the loss in daily rate in November was nearly twice that in October, or 5110 tons per day, compared with 2598 tons per day. For the first time this year the daily rate fell below 100,000 tons. The chief loss in output centered in the steel-making iron furnaces. With a net loss of 14 furnaces last month, the total loss since June has been 92.

Production of coke and anthracite pig iron for the 30 days in November amounted to 2,894,295 gross tons, or 96,476 tons per day, as compared with 3,125,512 tons or 101,586 tons per day for the 31 days in October. The November daily rate was the lowest for the year, and the total did not vary greatly from November, 1922. There were 17 furnaces blown out or banked and three blown in, a net loss of 14. In October the net loss was 10.

The total number of furnaces in blast on Dec. 1 was 231, as compared with 245 on Nov. 1. On July 1 there were 323 in blast, the peak for the year. The capacity of the 231 furnaces in blast Dec. 1 is estimated at 94,345 tons per day, as compared with 99,030 tons per day for the 245 furnaces operating on Nov. 1.

A sharp decline in ferromanganese output took place in November, with only 14,839 tons made. The spiegeleisen was the second highest of the year at 16,783 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from November, 1922, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
November, 1922	72,177	22,813	94,990
December	75,179	24,398	99,577
January, 1923	79,991	24,190	104,181
February	80,684	26,251	106,935
March	87,881	25,792	113,673
April	90,145	28,179	118,324
May	96,029	28,735	124,764
June	90,907	31,641	122,548
July	88,798	29,858	118,656
August	86,479	24,795	111,274
September	78,799	25,385	104,184
October	77,255	24,331	101,586
November	72,352	24,124	96,476

The figures for daily average production, beginning with January, 1917, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1917—Gross Tons

	1917	1918	1919	1920	1921	1922	1923
Jan.	101,643	77,799	106,525	97,264	77,945	53,063	104,181
Feb.	94,473	82,835	105,006	102,720	69,187	58,214	106,935
Mar.	104,882	103,648	99,685	108,900	51,468	65,675	113,673
Apr.	111,165	109,607	82,607	91,327	39,768	69,070	118,324
May	110,238	111,175	68,002	96,312	39,394	74,409	124,764
June	109,002	110,793	70,495	101,451	35,494	78,701	122,280
July	107,820	110,354	78,340	98,931	27,889	77,592	118,656
Aug.	104,772	109,341	88,496	101,529	30,780	58,586	111,274
Sept.	104,465	113,942	82,932	104,310	32,850	67,791	104,184
Oct.	106,550	112,482	60,115	106,212	40,215	85,092	101,586
Nov.	106,859	111,802	79,745	97,830	47,183	94,990	96,476
Dec.	92,997	110,762	84,944	87,222	53,196	99,577	.....
Year	104,619	105,496	83,789	99,492	45,325	73,645	.....

Among the furnaces blown in during November were the following: The Belfont and Jisco furnaces in southern Ohio.

Among the furnaces blown out or banked during November were the following: Genesee furnace in New York; the Keystone and one Warwick furnace in Schuylkill Valley; No. 3 Shenango furnace in the Shenango Valley; C and D furnaces at the Cambria plant of the Bethlehem Steel Co. and the Dunbar furnace in western Pennsylvania; the Norton furnace in Kentucky; No. 2 Otis furnace of the Otis Steel Co. in northern Ohio; Nos. 2 and 3 South Chicago furnaces of the Illinois Steel Co. and Nos. 7 and 11 Gary furnaces in the Chicago district; No. 1 Gadsden furnace of the Alabama Co. in Alabama and the Clarksville, Standard and one Allen's Creek furnace in Tennessee.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for November and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	Nov. (30 days)	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)
New York	193,621	219,857	208,737	246,347
New Jersey	18,509	19,473	18,293	19,449
Lehigh Valley	82,748	81,614	73,945	79,529
Schuylkill Valley	73,069	91,457	88,699	108,448
Lower Susquehanna and Lebanon Valleys	63,720	60,568	56,531	56,884
Pittsburgh district	595,876	653,970	659,963	713,314
Shenango Valley	99,228	117,656	127,781	117,133
Western Pa.	116,910	157,649	157,960	193,611
Maryland, Virginia and Kentucky	68,787	60,278	55,581	81,826
Wheeling district	136,349	141,593	147,771	159,418
Mahoning Valley	280,667	279,834	286,558	338,466
Central and Northern Ohio	265,198	282,009	273,885	287,641
Southern Ohio	24,619	36,083	37,416	46,779
Illinois and Indiana	535,362	595,457	587,323	631,225
Mich., Minn., Mo., Wis. and Colo.	111,291	117,128	113,460	121,172
Alabama	215,613	213,105	213,083	230,468
Tennessee	12,676	21,427	18,526	17,783
Total	2,894,295	3,149,158	3,125,512	3,449,493

Capacities in Blast Nov. 1

The following table shows the number of furnaces in blast Dec. 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Nov. 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	Nov. 1 In Blast	Nov. 1 Capacity per Day	Dec. 1 In Blast	Dec. 1 Capacity per Day
New York:					
Buffalo	21	15	6,140	15	5,965
Ferromanganese	1	0	.....	0	.....
Other New York	5	2	400	1	130
New Jersey	4	2	625	2	615
Pennsylvania:					
Lehigh Valley	16	6	2,430	6	2,510
Spiegeleisen	2	2	210	2	250
Schuylkill Valley	15	9	2,750	7	2,370
Lower Susquehanna	9	5	1,525	5	1,610
Ferromanganese	1	1	65	1	70
Lebanon Valley	6	1	115	2	365
Ferromanganese	2	1	85	1	80
Pittsburgh district	55	43	19,350	43	19,355
Ferro and Spiegel	4	3	485	3	505
Shenango Valley	19	9	3,760	8	3,300
Western Pennsylvania	25	13	4,880	12	3,660
Ferro and Spiegel	2	2	300	0	.....
Maryland	5	3	960	3	1,045
Ferromanganese	1	1	100	1	80
Wheeling district	15	10	4,500	10	4,545
Ohio:					
Mahoning Valley	28	19	9,000	19	9,355
Central and Northern	26	18	9,000	17	8,555
Southern	16	3	1,030	5	1,190
Illinois and Indiana	42	35	18,950	31	17,010
Mich., Wis. and Minn.	12	8	3,295	8	3,310
Colorado and Missouri	6	1	410	1	400
The South:					
Virginia	18	4	700	4	565
Kentucky	7	2	400	1	305
Alabama	39	22	6,965	21	6,805
Ferromanganese	1	0	.....	0	.....
Tenn., Ga. and Texas	16	5	600	2	365
Total	418	245	99,030	231	94,345

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the foregoing totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These

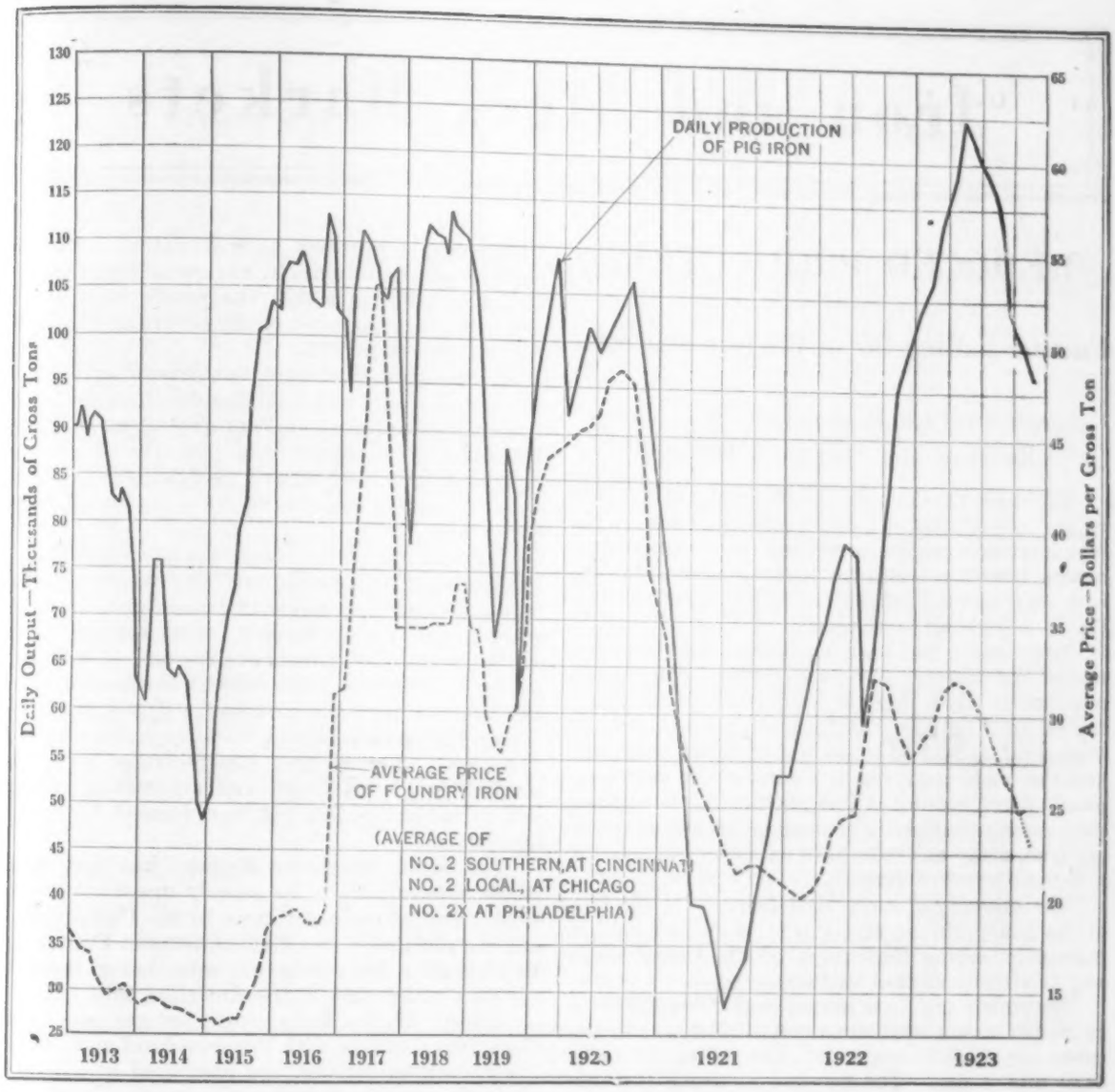

Diagram of Pig Iron Production and Price

last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production		Spiegeleisen and Ferromanganese 1922		1923	
	1922	1923	Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan.	1,306,045	2,479,727	6,874	1,230	19,358	12,056
Feb.	1,311,170	2,259,154	3,610	4,930	21,282	3,657
Mar.	1,629,982	2,724,305	11,600	2,095	20,730	13,832
Apr.	1,707,902	2,704,360	14,998	4,211	20,808	7,440
May	1,879,180	2,976,892	15,432	4,902	19,568	9,533
June	1,876,033	2,727,208	18,273	4,817	19,717	18,289
6 mos.	9,710,312	15,871,646	70,787	22,185	121,564	64,807
July	1,931,138	2,752,738	18,873	7,176	26,493	12,876
Aug.	1,415,832	2,680,851	11,402	7,925	22,045	5,586
Sept.	1,615,696	2,363,967	10,681	4,235	23,206	4,478
Oct.	2,047,873	2,394,922	9,193	12,283	20,015	15,931
Nov.	2,165,295	2,170,567	13,232	4,192	14,839	16,783
Dec.	2,330,545	.....	17,007	10,591	.....	.....
Year	21,216,691	.....	151,175	68,587	.....	.....
11 mos.	.....	28,234,691	.....	.....	228,162	120,461

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1919—Gross Tons

	1919	1920	1921	1922	1923
Jan.	3,302,260	3,015,181	2,416,292	1,644,951	3,229,604
Feb.	2,940,168	2,978,879	1,937,257	1,629,991	2,994,187
Mar.	3,090,243	3,375,907	1,595,522	2,035,920	3,523,868
Apr.	2,478,218	2,739,797	1,193,041	2,072,114	3,549,736
May	2,108,056	2,985,682	1,221,221	2,306,679	3,867,694
June	2,114,863	3,043,540	1,064,833	2,361,028	3,676,445
½ year	16,033,808	18,138,986	9,428,166	12,050,683	20,841,534
July	2,428,541	3,067,043	864,555	2,405,365	3,678,334
Aug.	2,743,388	3,147,402	954,193	1,816,170	3,449,493
Sept.	2,487,965	3,129,323	985,529	2,033,720	3,125,512
Oct.	1,863,558	3,292,597	1,246,676	2,637,844	3,149,158
Nov.	2,392,350	2,934,908	1,415,481	2,849,703	2,894,295
Dec.	2,633,268	2,703,855	1,469,086	3,086,898	.....
Year*	30,582,878	36,414,114	16,543,686	26,880,383	.....
11 mos.	.....	.....	.....	.....	37,138,326

*These totals do not include charcoal pig iron. The 1922 production of this iron was 224,731 tons.

Production and Price Chart

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production, by months, of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

An examination for junior mechanical engineer for aeronautical work, will be held throughout the country on Jan. 9, to fill vacancies in the engine test laboratory, Navy Yard, Washington, at entrance salaries ranging from $5.04 to $7.20 a day. Application blanks may be obtained from the United States Civil Service Commission, Washington, or at the post office or customhouse in any city.

Iron and Steel Markets

REDUCED PRODUCTION

Further Falling Off in Pig Iron and Steel

Carnegie Steel Co. Buying Lifts Steel Scrap—Railroad and Structural Demand

The main developments of the week are a decline in pig iron output, a further quieting down of pig iron buying, more indication that leading steel producers intend to continue present prices into the new year, and the appearance of the Carnegie Steel Co. as a buyer of steel scrap.

Since there had been no formal Carnegie buying of old materal for many months, this week's purchases, while put at but 15,000 tons, have caused no little stir. At Pittsburgh heavy melting steel scrap is held $2 a ton higher than a week ago, and the trade is trying to interpret the steel company's move, coming at this juncture in the finished steel price situation. For months the low prices of pig iron, scrap and coke have led buyers to look for a decline in rolled steel.

The stopping of more blast furnaces in the face of the heavy buying of pig iron in the last half of November means that much of the bargain iron sold is already stocked in furnace yards.

November pig iron output was 2,894,295 tons, or 96,476 tons a day, against 3,125,512 tons in October, or 101,586 tons a day, the falling off being 5110 tons a day. The net loss in active furnaces was 14. On Dec. 1 the capacity of the 231 stacks in blast was 94,345 tons a day, comparing with 99,030 tons a day for the 245 furnaces in blast one month previous.

Pig iron production is now at the rate of about 34½ million tons a year, nearly the same as that for November, 1922. At the peak in May of this year, the annual rate was over 45 million tons.

While the new car and locomotive programs of the railroads hinge on steel prices as well as on what Congress does or refrains from doing, 1924 is already counted on as a great year for trackwork. The Santa Fe is now asking for 100,000 tons of rails and nearly 25,000 tons of angle bars, tie plates, spikes and bolts.

Current equipment business takes on larger proportions with the purchase of 3500 cars, with active negotiations on an increased volume of repair work and with definite inquiries for upward of 3800 cars. This figure includes 3057 for the Southern Pacific lines, so that that system is now in the market for more than 9600.

With awards of 28,000 tons in fabricated steel, mostly for private enterprises and 20,000 tons of it in the East, building has had another active week. Fresh inquiries are about 10,000 tons; but the volume of railroad bridge and station work recently figured on, and public work, chiefly for school buildings—50,000 tons in New York alone in the next six months—point to continued demand on a good scale.

Steel works operations show some improvement in the Youngstown district, but are unchanged in Pittsburgh, Johnstown and Wheeling. Further curtailment will come in the next three weeks. Indications now are that the year's steel output will fall somewhat short of the record of 43,600,000 tons of ingots in 1917.

In merchant steel bars, consumers' inventories are quite low and will be kept so until after Jan. 1. In soft steel reinforcing bars quotations of 2.30c., Pittsburgh, are appearing. In the Southwest prices on such bars named by Southern mills indicate a marked concession from the usual Pittsburgh base.

Pig iron buying last week was much less than in the preceding two weeks, and this week there has been a decided decrease, with indications that there will not soon be much demand for the second quarter of next year. Exceptional are two lots of 5000 tons each of malleable, one for delivery through May and the other through the first half. Prices are called firmer, but on malleable at Pittsburgh there is wide variation. Charcoal and silvery irons have been marked up $1. Railroad and automobile activity will go far in deciding pig iron demand for second quarter.

The South Manchuria Railway has just added 22,000 tons of rails to its already unusual total for 1923. Half of the order came to the United States and the remainder was divided between French and Belgian mills, their delivered price being about 10 per cent under that of the American mill.

Efforts of the Ruhr works to resume operations, in accordance with the agreement signed with the French authorities, are hampered by shortage of funds and by disinclination of the workers to accept the 10-hr. day.

Pittsburgh

Producers of Finished Materials Firmer as to Prices—Sentiment Improves

PITTSBURGH, Dec. 4.—While the past week has seen no general or material increase in steel buying as compared with the recent past, it has brought definite signs of a firmer attitude with regard to prices on the part of producers. Evidently it is believed that buyers' necessities are daily becoming more important than the price and there has been a distinct stiffening in those products which recently stood out as the weak spots in the market. The sheet makers now accepting business at less than the Steel Corporation bases are fewer than they were recently. Also there has been a general withdrawal of prices below 3c., base, for cold-finished steel bars, and the exhaustion of low-priced bars and the failure of the bar market to ease off have prompted a firmer stand by makers of bolts, nuts and rivets. Although low prices have not entirely disappeared in hot-rolled flats, there is more general observance of the regular base of 3c. than there was recently. Local mills are firmer at 2.50c. for plates and shapes than they have been, probably because they are encountering less price competition from mills east and west of this district.

Sentiment is much more hopeful, a development to

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 4, 1923	Nov. 27, 1923	Nov. 6, 1923	Dec. 5, 1922
No. 2X, Philadelphia‡	**$24.26**	$24.14	$22.64	$29.14
No. 2, Valley furnace†	22.00	22.00	22.50	25.50
No. 2, Southern, Cin'ti†	25.05	25.05	23.55	27.05
No. 2, Birmingham, Ala.†	21.00	21.00	19.50	23.00
No. 2 foundry, Chicago*	23.00	23.00	24.00	28.00
Basic, del'd, eastern Pa	22.75	22.75	23.00	27.50
Basic, Valley furnace	21.00	21.00	22.00	25.00
Valley Bessemer, del. P'gh.	*24.26*	24.76	26.26	31.77
Malleable, Chicago*	23.00	23.00	24.00	28.00
Malleable, Valley	*20.00*	22.00	22.00	27.00
Gray forge, Pittsburgh	23.26	23.26	23.76	26.77
L. S. charcoal, Chicago	**29.15**	28.15	29.15	36.15
Ferromanganese, furnace	107.50	107.50	110.00	100.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	40.00	40.00	40.00	36.50
O.-h. billets, Pittsburgh	40.00	40.00	40.00	36.50
O.-h. sheet bars, P'gh	42.50	42.50	42.50	36.50
Forging billets, base, P'gh.	45.00	45.00	45.00	45.00
O.-h. billets, Phila	45.17	45.17	45.17	43.17
Wire rods, Pittsburgh	51.00	51.00	51.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.35	2.35	2.40	2.00
Light rails at mill	2.25	2.25	2.15	2.15
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.67	2.67	2.67	2.275
Iron bars, Chicago	2.40	2.40	2.40	2.35
Steel bars, Pittsburgh	2.40	2.40	2.40	2.00
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, New York	2.74	2.74	2.74	2.34
Tank plates, Pittsburgh	2.50	2.50	2.50	1.95
Tank plates, Chicago	2.60	2.60	2.60	2.30
Tank plates, New York	2.74	2.74	2.74	2.29
Beams, Pittsburgh	2.50	2.50	2.50	2.00
Beams, Chicago	2.60	2.60	2.60	2.20
Beams, New York	2.74	2.74	2.74	2.34
Steel hoops, Pittsburgh	3.00	3.00	3.15	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Dec. 4, 1923	Nov. 27, 1923	Nov. 6, 1923	Dec. 5, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.75	3.75	3.75	3.35
Sheets, galv., No. 28, P'gh	4.85	4.85	5.00	4.35
Sheets, blue an'l'd, 9 & 10	3.00	3.00	3.00	2.50
Wire nails, Pittsburgh	3.00	3.00	3.00	2.70
Plain wire, Pittsburgh	2.75	2.75	2.75	2.45
Barbed wire, galv., P'gh	3.80	3.80	3.80	3.35
Tin plate, 100-lb. box, P'gh	$5.50	$5.50	$5.50	$4.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$19.00**	$18.50	$17.50	$24.00
Carwheels, Philadelphia	**19.50**	18.50	17.50	20.00
Heavy steel scrap, P'gh	**18.50**	16.50	15.50	20.50
Heavy steel scrap, Phila	**16.00**	15.50	15.00	16.00
Heavy steel scrap, Ch'go	**15.00**	14.50	13.50	17.00
No. 1 cast, Pittsburgh	**19.50**	19.00	18.50	22.00
No. 1 cast, Philadelphia	20.00	20.00	19.00	20.00
No. 1 cast, Ch'go (net ton)	**19.50**	19.00	18.00	19.50
No. 1 RR. wrot., Phila	18.00	18.00	17.00	19.00
No. 1 RR. wrot., Ch'go (net)	**13.50**	13.00	12.00	15.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$3.75	$6.50
Foundry coke, prompt	5.00	5.00	4.75	7.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.25	13.00	14.12½
Electrolytic copper, refinery	12.87½	12.87½	12.37½	13.75
Zinc, St. Louis	*6.35*	6.37½	6.35	7.10
Zinc, New York	*6.70*	6.72½	6.75	7.45
Lead, St. Louis	**7.00**	6.70	6.45	6.95
Lead, New York	**7.10**	7.00	6.75	7.30
Tin (Straits), New York	**47.25**	47.00	41.87½	36.25
Antimony (Asiatic), N. Y.	*8.75*	9.00	9.00	6.40

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Dec. 4, 1923, Finished Steel, 2.775c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Nov. 27, 1923,	2.775c
Nov. 6, 1923,	2.775c.
Dec. 5, 1922,	2.439c.
10-year pre-war average,	1.689c.

Composite Price, Dec. 4, 1923, Pig Iron, $21.88 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Nov. 27, 1923,	$21.86
Nov. 6, 1923,	22.02
Dec. 5, 1922,	25.86
10-year pre-war average,	15.72

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which the recent turn in the primary materials is an important contribution. Steel buyers long have argued that there was no justification for present steel prices in view of the business in scrap, pig iron and coke. Scrap prices have had a stiff advance since a week ago, largely as the result of the appearance of the Carnegie Steel Co. as buyer after an absence from the market for about three years.

Activity in pig iron has subsided, and the fact that some of the advances announced following the wave of buying have failed to stand the test of attractive inquiries makes it apparent that the selling movement was not effective in all cases in reducing available supplies. It is also clear that the sales will be largely supplied from stock piles, since there is no evidence yet that any blast furnaces now idle in this district will be started up in the near future. Many of the large users of iron seem to have been guided more by the fact that iron was cheap than by their known requirements.

Failure of the rush of buying to bring about preparations for putting in additional blast furnaces has served to somewhat temper the price ideas of coke producers, many of whom figured that $4.50 per net ton at ovens could be obtained for first quarter tonnages. Actually $4.40 has been the highest obtained, and in the past day or two $4.25 has become the prevailing price.

Steel works operations show some improvement in the Youngstown district, but are no better in Pittsburgh, Johnstown and Wheeling than they have been. The blast furnace record for this and nearby districts now shows 90 in production, one banked and 50 cold. At the beginning of the year, 101 furnaces were in production, and the peak point reached in early summer found 127 making iron.

Pig Iron.—Trading has dwindled to very moderate proportions in the past week and sales at the advanced prices except for very small tonnages of foundry iron have been rather difficult. So many of the larger consumers were able to fortify themselves against their requirements for some time to come that buying now is from the smaller consumers. The market on foundry iron is fairly well established at $22, Valley furnace, for the base grade, and some sales are reported to have been made as high as $22.50. There are no offerings of basic iron below $21, Valley furnace, and that price also is quoted at Johnstown, Pa., while some makers are talking $21.50 for first quarter tonnages. Prices on this grade are untested in the absence of important transactions. Actually a Pittsburgh district sheet maker is reported to have closed recently for 15,000 tons at $19.50 from a western Pennsylvania furnace having the same rate of freight into Pittsburgh as the Valley producers. Details of this sale are withheld by both parties involved in the transaction. Although known sales of Bessemer iron last week were at $23, Valley furnace, and the market appeared established at that figure, there have been sales in the past week at $22.25, Valley furnace, while at least one maker of this grade is openly quoting $22.50. A Paden City, W. Va., consumer of Bessemer iron has an inquiry out for 2000 tons on which it is claimed a price of $24.90, delivered, or $22, Valley furnace, has been quoted. Most makers are quoting $23, but with one producer $22.50, the quotable market is within range of those two prices. Not enough business is developing in low phosphorus iron to determine the real quotation, but makers are holding to their recent quotations. Malleable iron has developed fresh irregularity since a week ago. A Barberton, Ohio, consumer recently closed for 2000 tons at $20, Valley furnace, and there is more iron available at this price. On the other hand, $22 is a very common asking price and one sale of 2000 tons is noted at $22.50, Valley furnace. This transaction, however, went to the seller without competition. W. P. Snyder & Co. make the average price of Bessemer iron from Valley furnaces in November $23.032, against $25.20 in October, and of basic iron $20.81, against $23.25 in October.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$21.00
Bessemer	$22.50 to 23.00
Gray forge	21.50 to 22.00
No. 2 foundry	22.00 to 22.50
No. 3 foundry	21.50 to 22.00
Malleable	20.00 to 22.50
Low phosphorus, copper free	29.00

Ferroalloys.—Considerable business in ferromanganese has been closed in this district in the past week by domestic producers at $107.50, Atlantic seaboard. Sales are placed at 3000 tons, bringing the total bookings at that price to about 6000 tons for the past two weeks. Accumulation of this backlog of business has been followed by a withdrawal of the price and the naming of one of $109, or $1 a ton below that quoted and consistently adhered to by British producers. Not much British material is moving because of expectations by consumers that the British price might weaken. Jones & Laughlin Steel Corporation now is making its own ferromanganese, having recently put one of its Aliquippa furnaces on that product. It was a big purchaser of foreign manganese ore prior to the passage of the tariff law imposing a duty on both manganese ore and ferromanganese. No announcement yet has been made as to the 1924 price for 50 per cent ferrosilicon, but the common expectation is $80, delivered, east of the Mississippi. Prices are given on page 1547.

Bessemer Ferrosilicon and Silveries.—Effective Dec. 1, Jackson, Ohio, makers advanced prices $1 a ton, thus restoring the schedules, which had been in effect prior to Nov. 26. The new schedule quotes 6 per cent silvery iron at $30, furnace, and 10 per cent ferrosilicon at $41.50.

Semi-Finished Steel.—Some quickening of interest is reported, but thus far it has not found reflection in sales, which are of small lots for prompt delivery in most cases. One maker of wire rods reports the specification of a good-sized tonnage for the first quarter of 1924, but the more common condition is that users are merely covering their actual and immediate requirements. If there is any shading of $42.50, Pittsburgh or Youngstown, it is being carefully concealed, as all makers here and in Youngstown are quoting that price. The more common price on billets and slabs still is $40, although there are claims of sales at higher figures. On forging steel, $45, base, is the price for small lots, with the basis for large tonnages a matter of negotiation. Labor being fairly plenty, there is not the tendency to insist on the full differential over rolling billets. Prices are given on page 1547.

Iron and Steel Bars.—There has been no breaking through the 2.40c. base by local mills as yet, and all, notably the Carnegie Steel Co., are very firm at that figure. The real test of the market is ahead, however, as none of the mills has much unfilled business and important users, such as makers of cold-finished steel bars and bolts, nuts and rivets, are disposed to regard the price as too high in relation with those of their products. Hot-rolled bars at 2.40c., base, means 2.55c. base, on bars for cold finishing, since there is an extra of 15c. per 100 lb. for bars for that purpose. Current demands for hot-rolled bars are fairly numerous, but there is not much sign of forward buying. Iron bar prices also hold at recent levels, with demand light in keeping with the dwindling order books of car builders.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold-finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Wire Products.—Buying remains very steady, but it runs chiefly to small lots for prompt delivery. Forward buying still is lacking. Granting of the price guarantee against a decline to June 1, 1924, on woven wire fence has produced a fair number of orders. Most mills are building stocks, but have not made much progress in that direction on the smaller sizes of nails, current demands for which remain well up with production. There is little talk of price shading, except on coated nails, on which some mills are wont to give away part of their freight advantage in markets like the present one. Prices are given on page 1546.

Steel Rails.—Lack of activity still is without influence upon the price ideas of makers of billet light rails, all of whom still are holding to 2.25c., base. Rerolled rails have been quoted as much as $10 per ton below the price on billet rails.

We quote light rails rolled from billets at 2.25c. base (25-lb. to 45-lb.); rerolled rails, 1.85c. to 2c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, $43 per gross ton mill, for Bessemer and open-hearth sections.

Tubular Goods.—Mills in this and nearby districts generally are well provided with orders for standard pipe, and while demand is not so insistent as it was a short time ago, this is regarded as a purely seasonal condition, brought about partly by the decline in building activities and also by the close proximity of inventory-taking time. New orders usually stipulate that if delivery cannot be made by Dec. 15, the shipment be deferred until after Jan. 1. Backlog orders for oil well pipe were pretty well reduced in November, but mills have not yet adopted an aggressive policy with regard to new business, believing that the turn in the oil situation will bring about a natural recovery in demand. Boiler tubes show little activity and the price situation is less firm than in pipe, in which concessions even on line pipe are reported to be disappearing. Discounts are given on page 1546.

Sheets.—The situation looks brighter from both a price and sales standpoint. The American Sheet & Tin Plate Co., notwithstanding that its prices are higher than several of the independent companies, reports a very satisfactory business, while a reduction in the number of independent mills accepting business at less than the price of the Steel Corporation subsidiary is taken to mean that general demand is better. There is no quotable change in the range of prices, but the market is firmer to the extent that the minimum prices are not available from as many sources as recently. The automotive industry is said to have reached a point where the supply is more important than the price. The American Sheet & Tin Plate Co. is operating about

80 per cent of its mills, while independent mill operations, which averaged about 70 per cent last month, are close to that rate today. Prices are given on page 1546.

Tin Plate.—Steel Corporation customers are specifying freely against early 1924 requirements, but this is not generally the case with those of the independents, who for the most part are delaying orders until they know thoroughly how they are going to stand at the end of the year. Current business does not amount to much. The American Sheet & Tin Plate Co. has about 94 per cent of its tin mills in operation and at least two of the local independent companies are doing as well or better. The price is $5.50 per base box, Pittsburgh, for standard cokes.

Cold-Finished Steel Bars and Shafting.—The past week has seen the disappearance of prices below 3c., base, for carload lots. Concessions from that level of from $2 to $5 recently made presumably were possible from the existence in the hands of makers of some low-priced hot-rolled bars that did not carry present extras. Such stocks now are believed to have become exhausted and with a price of 2.40c., base, for hot-rolled bars plus the extra of 15c. per 100 lb. for analysis and the new and higher card of size and other extras, the cost factor has become more dominant. Business has not improved much, but the trade is more hopeful. Ground shafting remains at 3.40c., base, f.o.b. mill for carload lots.

Hot-Rolled Flats.—Business shows some betterment, although orders are heavier for delivery after than before Jan. 1. There is rather more general observance of 3c., base, on hoops, bands and strips than there was recently, but concessions from that level have not entirely disappeared and where the tonnage is attractive, as it usually is in rim stock and wide strips, it is doubtful if the 3c., base, is yet common. Prices are given on page 1546.

Cold-Rolled Strips.—Most makers are holding to 5c., base, but business still is being lost at that figure, 4.90c. being quoted for quick deliveries and sometimes on very small tonnages.

Track Fastenings.—New York Central inquiry for 50,000 to 75,000 kegs of spikes brought out prices of 3c. per lb., Buffalo, 3.15c., Chicago, and 3c., Pittsburgh, on large ones and rather established the market at those levels on large lots. Other track accessories show no special change in price, but pending the closing of some of the big orders, up for bids, the real level is rather uncertain, since current business is not large enough to provide a test. Prices are given on page 1546.

Plates.—Although there has been no material increase in demand, there has been some decrease of competition and the market is firmer at 2.50c. base, Pittsburgh, than it was recently. Prices are given on page 1546.

Structural Material.—Most of the jobs that are being taken by fabricating shops here run to very small tonnages and demands upon the mills are correspondingly small. The warehouse project for the Rosenbaum Co., Pittsburgh, involving about 3000 tons of steel, again is active, but other important structural work in this territory still is dormant. The mills seem to be firmer at 2.50c. for large structural shapes than they were recently despite the lack of activity. Prices are given on page 1546.

Bolts, Nuts and Rivets.—Makers of these products have assumed a firmer stand and are less disposed to take business at the expense of prices. Low costing steel bars are pretty well used up and makers also are confronted with the possibility of no recession from today's price. There has been fresh affirmation of a quotation of 60 and 10 per cent off list for large machine bolts, and $2.90, base, per 100 lb. for heavy structural rivets now is the minimum price of practically all makers. There has been a slight revision in the quotation on hot-pressed nuts, which are now quoted at $4.50 off list as against recent price of $4.25 off list. Prices and discounts are given on page 1546.

Coke and Coal.—Little change has occurred in spot coke prices since a week ago. Supplies of spot furnace grade about equal the demand and business ranges from $5 to $5.50 per net ton at oven, and occasionally the minimum price is shaded. There has been no scramble on the part of pig iron producers to line up their first quarter coke requirements, and oven operators have found it hard to do business except by modifying their prices. Two first quarter contracts were closed at $4.40, but since then one involving 10,000 tons a month was placed at $4.25, and one large operator is freely quoting that price. A price of $6.60 has been named by one large producer of foundry coke for first half of 1924, but this company usually is 50c. to $1 a ton above others and $6 is more commonly quoted. Neither price has yet found much basis in sales. The coal market shows a decided strength in slack grade which has become very scarce with the subsidence of demand for lump coal. Steam slack now commands $1.50 per net ton at mines readily and on gas slack there have been sales as high as $1.75. Mine run steam coal ranges from $1.90 to $2.40 in the Panhandle district. Coking coal ranges from $1.75 to $2.25 and gas coal from $2.25 to $2.50.

Old Material.—Much excitement and a rather steep advance in prices of the steel works grades has attended the entrance of the Carnegie Steel Co. in the scrap market after an absence, as far as its own requirements were concerned, of almost three years. This company bought 15,000 tons of heavy melting steel at $19, delivered. This establishes the market for the time being at that level, although no other mills in this district have shown a disposition to follow this advance. Unless that interest continues in the market, it is thought the market will recede from lack of support, but just now dealers are disposed to hold more firmly than ever in the expectation of repeat orders. The market gained some strength from purchases from another Steel Corporation subsidiary, and the recent activity in pig iron caused such a spirited demand for blast furnace material from merchant furnaces that borings and turnings had shown independent strength.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$18.50 to $19.00
No. 1 cast, cupola size	19.50 to 20.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa	18.50 to 19.00
Compressed sheet steel	16.50 to 17.00
Bundled sheets, sides and ends	15.00 to 15.50
Railroad knuckles and couplers	20.00 to 20.50
Railroad coil and leaf springs	20.00 to 20.50
Low phosphorus blooms and billet ends	21.50 to 22.00
Low phosphorus plate and other material	20.00 to 20.50
Railroad malleable	17.50 to 18.00
Steel car axles	19.00 to 19.50
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	13.00 to 13.50
Sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	14.00 to 14.50
Heavy breakable cast	17.00 to 17.50
Stove plate	14.00 to 14.50
Cast iron borings	14.50 to 15.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	18.50 to 19.00

Valley Scrap Market Is Not Unduly Excited

YOUNGSTOWN, Dec. 4.—While the purchase of heavy melting scrap at Pittsburgh by the Carnegie Steel Co. has exerted a sentimental effect on the Youngstown market, strengthening the price situation, the top of the market on heavy melting here is $18; in fact, it is not unlikely that dealers would consider business at $17.50 on a firm order. This opinion was expressed today by one of the larger dealers, supplying most of the Valley steel interests.

Melters are doing little scrap buying in this district at present, and consequently prices do not show the firmness exhibited in localities where buying is brisk. For instance, the market on compressed sheet steel is characterized as flat with the price range from $14.50 to $15 and business likely to move at the lower figure. It appears that Valley steel interests do not yet see enough new business in sight to justify scrap purchases on any sizable scale.

Chicago

Prospective Railroad Buying and Some Orders Feature the Market

CHICAGO, Dec. 4.—Prospective railroad buying holds the center of the stage. The Atchison, Topeka & Santa Fe has entered the market for 100,000 tons of rails and 25,000 tons of track supplies. The Southern Railway has placed orders for 2000 box cars in addition to the 1000 bought a week ago, and the Southern Pacific has finally asked for figures on 3057 refrigerator cars for the Pacific Fruit Express. The Southern Railway cars will be built at St. Louis, and Western mills will probably furnish the steel required. Not only is considerable new business in sight which will come directly or indirectly from the carriers, but specifications against rail contracts are heavier than had been expected.

Notwithstanding these signs of improvement, mill bookings still fall short of shipments and current demand from manufacturing and distributing buyers of steel is notably light. Steel stocks of industrial customers are exceedingly low, indicating that additional supplies must be purchased soon if manufacturing operations are to be maintained. While these buyers are apparently in no hurry to replenish their stocks, particularly just prior to inventory taking, they have not concealed their willingness to place substantial tonnage at concessions. One mill could have booked from 15,000 to 20,000 tons if it had been willing to sell at a small recession from its prices. Chicago producers, however, are holding firmly to their quotations, in spite of the efforts of users to break the market.

Mill operations show a slight recession. The Illinois Steel Co. is producing steel at the rate of 75 per cent of capacity, with the possibility that it may reach the 80 per cent rate of last week before the current week closes. Owing to repairs to its sheet bar mill, the operations of the Inland Steel Co. have temporarily declined to 70 per cent.

Ferroalloys.—Sales of ferromanganese in the past two weeks aggregated about 1500 tons. Most of this tonnage was placed at from $106.50 to $107.50, seaboard, although the most recent sale, a carload for Milwaukee delivery, brought $109, New Orleans. A few sales of spiegeleisen have been made at $39, furnace, or $47.58, delivered Chicago. Small tonnages of 50 per cent ferrosilicon have changed hands at as low as $81, delivered.

We quote 80 per cent ferromanganese, $114.88 to $116.56, delivered; 50 per cent ferrosilicon, $81, delivered; spiegeleisen, 18 to 22 per cent, $47.58, delivered.

Pig Iron.—Although a number of large sales have been made during the past week, the volume of buying has been gradually declining. Such a reaction after the unusual activity of the past three weeks was not unexpected. There is still considerable inquiry in the market and more will come out as soon as the manufacturing programs of foundries are more clearly defined. Car builders, for example, can hardly place their first quarter requirements until the railroad cars now on inquiry are ordered. Prices on Northern iron are steady and unchanged, but another buying spurt would probably force them upward again. Prominent among recent sales may be mentioned 5000 tons of malleable bought by a Milwaukee melter for first half, 2400 tons of malleable and foundry and 1200 tons of malleable ordered by two other Milwaukee users for first quarter, 1000 tons of foundry purchased by a Michigan melter for first quarter and 1000 tons of foundry placed by a Chicago buyer for first half. A local melter is inquiring for 3000 tons of foundry for first quarter and a Peoria user wants 2000 tons of basic for the same shipment. A local buyer is in the market for 500 to 750 tons of malleable for delivery at Galesburg during the next two or three months. Southern iron is firm at $21 base, Birmingham, and there have been a few small sales at that price. Charcoal has advanced $1 a ton to $26, base, furnace, and some business has been closed at the new price. A Minnesota melter wants 400 tons of charcoal. Silvery, which declined $1 last week, has advanced the same amount, so that it is back on its former price level. A Wisconsin melter is inquiring for 200 tons of silvery. A local buyer is in the market for 300 to 500 tons of 15 per cent Bessemer ferrosilicon for first quarter delivery. A St. Louis district melter wants 100 tons of 12 per cent Bessemer ferrosilicon. A local steel works furnace which has been an important seller of merchant iron no longer has any foundry iron to sell.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumer's yard or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal averaging sil. 1.50, delivered at Chicago..	$29.15
Northern coke, No. 1 sil. 2.25 to 2.75	$23.50 to 24.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	23.00 to 23.50
Malleable, not over 2.25 sil.	23.00 to 23.50
Basic	23.00 to 23.50
High phosphorus	23.00 to 23.50
Southern No. 2	27.01
Low phos., sil. 1 to 2 per cent, copper free	34.79
Silvery, sil. 8 per cent	37.29

Plates.—In the absence of orders for oil storage tanks and railroad cars, plate buying is at low ebb. Prospects for business are good, however, in view of the large number of cars now on inquiry. Meanwhile the local prices on plates are holding firm.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Sheets.—The local independent has taken 1500 tons additional in black sheets for Japan and, with previous bookings for that country together with domestic commitments, is comfortably obligated for some time to come. Sheet mills generally are in an improved condition so far as bookings are concerned and prices are gradually gathering strength. Those producers who offered sharp concessions in black and galvanized sheets are showing less inclination to take business under the Steel Corporation prices. While 3.75c., base, Pittsburgh, can still be done on black, the lowest going price on galvanized appears to be 4.90c., base, Pittsburgh, and that is rapidly disappearing.

Mill quotations are 3.75c. to 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 4.90c. to 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4c. for blue annealed, 4.70c. for black and 5.85c. for galvanized.

Cast Iron Pipe.—Detroit has awarded 2400 tons of 12- and 24-in. to the Lynchburg Foundry Co. and 2000 tons of 8-in. DeLavaud centrifugal cast iron pipe to the United State Cast Iron Pipe & Foundry Co. The Public Service Co. of Northern Illinois, with general offices at Chicago, has taken bids on 2800 tons of 4-, 6-, 10- and 12-in. Prices are steady at $47, base, Birmingham, for 6-in. and larger, but higher quotations have disappeared except upon unimportant lettings.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $59.20; 6-in. and above, $55.20; class A and gas pipe, $5 extra.

Structural Material.—Fabricating awards were few during the past week, but a number of large projects are pending or about to come up for figures. Preliminary figures on the Union League Club Building, Chicago, exceeded the appropriation authorized by the membership and plans for the structure will be revised. Fabricators' stocks of plain material are very low and for that reason mills expect new structural awards to be immediately reflected in orders for steel. Plain material prices are unchanged.

The mill quotation on plain material is 2.60c., Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Rails and Track Supplies.—The Atchison, Topeka & Santa Fé is inquiring for 100,000 tons of rails and approximately 25,000 tons of angle bars, tie plates, spikes and bolts. This inquiry, together with that of the New York Central for track supplies, promises to add mate-

rially to the bookings of local mill. The Minneapolis & St. Louis has placed 5000 tons of rails with a local producer. The Soo Line, which had entered the market for 3000 tons of rails, has decided to defer buying until after the first of next year. Miscellaneous orders for track supplies are fairly numerous and specifications against rail contracts are heavier than had been expected. Demand for light rails shows no improvement.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.55c. to 2.60c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.90c. base and track bolts, 4.90c. base.

Bolts and Nuts.—Finding that sharp concessions have failed to stimulate buying, manufacturers of bolts and nuts are taking a firmer attitude on prices. Costs, which have increased with curtailed operations, would not, it is said, permit them to continue selling at such low figures. Discounts now quoted are those published on page 1546 but are on an f.o.b. Chicago basis except on large rivets, which range from $2.65 to $2.75 f.o.b. Pittsburgh.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.20c.; machine bolts up to ⅞ x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, $3.50 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Wire Products.—Essentially the situation remains unchanged, although mills are encouraged because manufacturing consumers have commenced to buy ahead in a small way. There seems to be a general desire, however, to keep inventories down to the minimum and this is holding back buying. The recent announcement of a guarantee against a decline in woven wire fence prices to June 1 has brought out a fair volume of business, although not as much as had been expected. For mill prices, which remain firm, see finished iron and steel, f.o.b. Pittsburgh, page 1546.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.80 per 100 lb.; cement coated nails, $3.25 per keg.

Reinforcing Bars.—Concrete bar lettings exceeding 100 tons each were few during the week, but a number of important pending projects are expected to be placed shortly. The general contract has been awarded for the Board of Trade Building, Kansas City, involving 700 tons, which will be bought presently. Hotel Duluth, Duluth, Minn., will require 400 tons, which is also about to be placed. Local warehouse prices remain unchanged at 3c., Chicago.

Lettings include:

Builders Exchange Building, St. Paul, Minn., 300 tons to Kalman Steel Co.

Three parcel post stations, Detroit, Mich., 250 tons to Joseph T. Ryerson & Son.

Matteson apartment building, Chicago, 150 tons to Concrete Steel Co.

Sewage disposal plant, Huntington, Ind., 130 tons to Kalman Steel Co.

Pending work includes:

Board of Trade Building, Kansas City, Mo., 700 tons, general contract awarded to Pratt & Thompson, Kansas City.

Hotel Duluth, Duluth, Minn., 400 tons.

Blue Valley Creamery Co. plant, Chicago, 250 tons.

Bars.—The steel inventories of bar buyers are very low and will probably be kept at a minimum figure until stocktaking has been completed and they are ready to go ahead with their first quarter programs. At the same time, the very fact that their supplies are so scanty indicates that they must replenish soon if they hope to maintain operations at anywhere near their normal rates. Evidently the average bar consumer sees no incentive in buying ahead at a time when there appears to be no imminent danger of an advance and possibilities of a decline are still given serious consideration. In fact, a number of important buyers have shown a willingness to place substantial tonnage at concessions, but thus far have failed to interest the mills, which are holding firmly to 2.50c., Chicago, on soft steel bars. Demand for bar iron is also light, although prices remain unchanged. New business in rail steel bars has shown slight improvement, although mill operations are still intermittent. Hard steel bars, however, are firm at 2.30c., mill.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.30c. for rounds and 4.80c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3c. base; hoops, 4.45c.; bands, 3.95c.

Old Material.—Outside of scattered purchases of small lots, consumer buying is an absent quantity and market activity is confined to the dealers. The latter continue to speculate on a sustained rise in prices and are buying railroad material for later delivery at figures which are appreciably higher than any user is willing to pay at the present time. So far as supplies for prompt shipment are concerned, some grades, notably car specialties, are not any too plentiful. The unwillingness of dealers to sell, except at advanced prices, of course, emphasizes the apparent shortage of certain materials. On the other hand, rejections by a local steel works have put some distress material on the market at concessions under ruling prices. On the whole, however, quotations must be regarded as higher than those published last week, although in many cases the advances have no foundation outside of speculative transactions among brokers. Railroad offerings include: Pennsylvania, Southwestern Region, 7500 tons; Pennsylvania, Northwestern Region, 3500 tons; Illinois Central, 1000 tons; Pere Marquette, 1000 tons; Monon, 500 tons; New York Central, Michigan Central, Big Four and Erie, blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$19.50 to $20.00
Cast iron car wheels	19.00 to 19.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Forged steel car wheels	18.50 to 19.00
Railroad tires, charging box size	18.50 to 19.00
Railroad leaf springs, cut apart	19.00 to 19.50
Rails for rerolling	16.00 to 16.50
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Shoveling steel	14.50 to 15.00
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheets	12.00 to 12.50
Axle turnings	11.50 to 12.00
Steel angle bars	17.00 to 17.50
Per Net Ton	
Iron angle and splice bars	19.00 to 19.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	25.00 to 25.50
Steel car axles	16.50 to 17.00
No. 1 busheling	11.00 to 11.50
No. 2 busheling	7.00 to 7.50
Cut forge	13.50 to 14.00
Pipes and flues	8.50 to 9.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	16.50 to 17.00
Coil springs	18.50 to 19.00
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	18.50 to 19.00
No. 1 agricultural cast	18.50 to 19.00
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	15.50 to 16.00
Machine shop turnings	6.00 to 6.50
Cast borings	9.75 to 10.25
Short shoveling turnings	9.75 to 10.25
Stove plates	16.00 to 16.50
Grate bars	15.50 to 16.00
Brake shoes	17.00 to 17.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	17.50 to 18.00

The Ford Motor Co. has purchased two lake freighters, the James Davidson and the L. M. Powers from the Tomlinson interests. These vessels are both 600-footers and will be taken over by the Ford company at the end of navigation this year. The Ford fleet will be augumented by two 600-ft. Diesel electric type freighters which are now under construction.

Employment in Detroit fell off 1297 during the week ended Nov. 20, according to the reports of the Employer's Association, which shows a total of 212,528 on the payrolls of the 79 representative firms reporting. A year ago the same concerns reported 179,340.

New York

Structural Awards Amount to 20,000 Tons—Schools Will Require 50,000 Tons

NEW YORK, Dec. 4.—Most of the district sales offices of steel companies report that the tonnage of finished steel booked in November, while not large, was slightly in excess of that taken in October. The steel trade continues to reflect an optimistic attitude and calls attention to the fact that except in plates, shapes and bars the situation as regards orders actually on the books or in sight is not unfavorable for good operation of mills in the first quarter. Structural work continues to occupy the center of the stage in local steel demand. The biggest job let is 12,000 tons for the new Pictorial Review Building on Ninth Avenue, which will be fabricated by the Levering & Garrigues Co. The latter company also will fabricate 4300 tons for a loft building on Seventh Avenue. The total awards for the week in New York and nearby territory exceed 20,000 tons. The New York City school building program for 1924 has been announced. Thirty-six schools are to be built and about six will be advertised each month for the first half of the new year. The total of steel requirements will be close to 50,000 tons. Railroad car work, mostly repairs, is slightly more active, but the largest new contract is for 1000 steel gondolas for the Baltimore & Ohio Railroad, which the Bethlehem Steel Co. will build. The price situation on all steel products is the same as a week ago.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c.; plates and structural shapes, 2.74c. to 2.84c.; bar iron, 2.74c.

Pig Iron.—A fairly large tonnage of pig iron was bought last week when one seller disposed of 13,000 tons, but the buying this week has been extremely light. The only inquiries of importance pending are from the New York Central, which is receiving bids on a total of 1200 tons of No. 2 and No. 2X, 600 for delivery at Frankfort, N. Y., and the other for delivery at Elkhart, Ind., and also 600 tons of charcoal. The A. P. Smith Co. is in the market for 600 tons of No. 2 and No. 2X for delivery at Bloomfield, N. J. The New York Air Brake Co., Watertown, N. Y., is reported to have closed on 2000 tons of foundry iron ranging from 2 to 3.50 per cent silicon. Melters are not disposed to contract for second quarter and furnaces are not at all anxious to quote for delivery after April 1. The probability of a strike of bituminous coal miners April 1 is a factor that is receiving attention to an increasing extent. Prices are fairly firm at $21 to $22, Buffalo, and $22.50 to $23, eastern Pennsylvania.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25	$25.27 to $25.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	24.77 to 25.27
East. Pa. No. 2, sil. 1.75 to 2.25	24.77 to 25.27
Buffalo, sil. 1.75 to 2.25	25.91 to 26.41
No. 2X Virginia, sil. 2.25 to 2.75	29.94 to 30.44
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 29.94

Ferroalloys.—Fairly large sales of ferromanganese have been made for delivery next year, the total amounting to several thousand tons. The price range has evidently been between $107.50 and $110, seaboard basis. It is believed that considerable changed hands at between $107.50 and $109, seaboard basis, mostly domestic alloy. The British quotation is unchanged at $110, seaboard. The domestic quotation is reported to be not less than $109, seaboard basis. There are substantial inquiries still before the market, some for delivery before the first half. The spiegeleisen market is quiet with prices unchanged, $40, furnace, being asked and obtained for the higher grade alloy. Buying of 50 per cent ferrosilicon is confined to small lots and few of them at unchanged quotations.

Cast-Iron Pipe.—Demand continues good, particularly for small lots for prompt shipment from users, who are enabled by the present open weather to complete small installations that under normal weather conditions would have been delayed until next spring. To customers willing to accept winter delivery, concessions of $2 or more per ton continue. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $61.60 to $63.60; 4-in. and 5-in., $66.60 to $68.60; 3-in., $76.60 to $78.60, with $5 additional for Class A and gas pipe. Shipments of soil pipe are still going forward to jobbers and consumers here are also able to use pipe that under normal weather conditions for this season would probably be delayed until spring. We quote discounts of both Southern and Northern makers, f.o.b. New York, in carload lots, as follows: 6-in., 30¾ and 35¾ per cent off list; heavy, 40¾ and 45¾ per cent off list.

Warehouse Business.—While there is a stiffening of prices on black and galvanized sheets, the low prices of 4.50c. for black and 5.50c. for galvanized still prevail, with some of the large sellers meeting competition at these prices. Blue annealed sheets have been reduced by the leading interest and leading independent warehouse in this district from 4.59c. to 4.34c. per lb., base, but, while not as prevalent, 4.20c. per lb., base, is still being done where competition enters into an order. The range of 25c. per 100 lb. on cold rolled shafting continues, 4.40c. to 4.65c. per lb. being the market on rounds. We quote prices on page 1570.

Coke.—Prices continue firm and unchanged. A northern New York consumer is reported to have closed on 2000 tons of standard foundry at $5.25. Standard foundry is quotable at $5.25 to $6.25 per ton and standard furnace at $4 to $4.50 per ton. Medium sulphur is fairly firm at $3.75 per ton. By-product coke is quoted at $10.91, Newark and Jersey City, N. J.

Old Material.—The market is decidedly strong, with heavy melting steel showing a marked upward tendency, largely as a result of activity among dealers and brokers. Thus far mills have shown but little inclination to advance their offers. As a result of activity in the trade, No. 1 heavy melting steel is quotable at from $16 to $16.50 per ton, eastern Pennsylvania, with most consumers still paying about $15.50 per ton delivered. Cast borings and machine shop turnings are quoted at $12 to $12.50 per ton delivered eastern Pennsylvania, with borings and turnings at $10.50 to $11. Specification pipe is strong at $15 per ton, eastern Pennsylvania, at which price considerable difficulty in obtaining tonnages is said to be experienced. In fact, a marked tendency is reported prevalent among collectors of scrap to hold material in anticipation of still higher prices. Stove plate is firm at $16, eastern Pennsylvania, and delivered to New Jersey consumers.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.00 to $12.50
Steel rails, short lengths, or equivalent	13.25 to 13.75
Rails for rolling	15.00 to 16.00
Relaying rails, nominal	25.00 to 26.00
Steel car axles	16.00 to 17.00
Iron car axles	23.00 to 23.50
No. 1 railroad wrought	13.50 to 14.00
Forge fire	8.50 to 9.00
No. 1 yard wrought, long	12.00 to 12.50
Cast borings (clean)	8.50 to 9.00
Machine-shop turnings	8.50 to 9.00
Mixed borings and turnings	7.00 to 7.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.00 to 11.50
Stove plate	12.00 to 13.00
Locomotive grate bars	12.50 to 13.00
Malleable cast (railroad)	14.00 to 15.00
Cast-iron car wheels	15.00 to 15.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	18.00
No. 1 heavy cast, not cupola size	14.50
No. 2 cast (radiators, cast boilers, etc.)	16.00

The development and possibilities of the application of gas in industrial furnaces is the subject of an address announced for a Providence, R. I., meeting of the American Society for Steel Treating, on the evening of Dec. 19, by H. O. Loebell, combustion engineer with the Combustion Utilities Corporation, New York. The meeting will be held at 98 Weybosset Street.

Cincinnati

Buying of Pig Iron Subsides—Price of Silvery Is Advanced

CINCINNATI, Dec. 4.—The pig iron buying movement has subsided and the market is again quiet. Last week's buying in this district was confined principally to silvery and charcoal iron, the low prices at which these were offered apparently being an incentive to users to place at least a goodly portion of their first quarter requirements. Charcoal and silvery furnaces, after accumulating a back log, have advanced prices $1 per ton. Foundry and malleable grades sold in fair volume during the early part of the week at $22.50 for southern Ohio foundry and malleable, and $21 the asking price for Southern iron. Sales of Southern iron were light during the week, the narrow differential between Northern and Alabama irons making the Northern brands a more attractive proposition. Sales in the South have been so heavy that only a few furnaces have a little iron to offer for December shipment. There is only limited interest in basic and Bessemer irons. Sales last week included 1500 tons of Buffalo iron to Indianapolis, two 500-ton lots of southern Ohio to nearby melters, and one 300-ton lot of Southern resale to a northern Ohio melter. An inquiry for 1000 tons of malleable for first half is current from Chattanooga, and one for 600 tons of foundry from central Ohio. Other scattered inquiries range from 100 to 400 tons. Jisco and Belfont furnaces in southern Ohio blew in last week, the former on silvery and the latter on foundry and malleable. Norton furnace at Ashland went out after a month's run on Bessemer.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	25.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	24.77
Basic Northern	24.77
Malleable	24.77

Sheets and Tin Plate.—Some mills are still quoting 3.75c. on black and 4.90c. on galvanized sheets for December and January delivery, but orders brought out are light, consisting of scattered carloads and less. Contracting for full first quarter is going along in fair shape at regularly established prices, and some producers are of the opinion that prices of sheets will show an advance about the first of February, due to expected heavy bookings by automobile manufacturers. Tin plate continues in good demand with prices very firm.

Reinforcing Bars.—A number of projects are up for bids, chief of which is a sewerage proposition in Cincinnati estimated to require about 300 tons. A number of projects, on which bids have been taken, have not been awarded. Prices continue to range from 2.20c. for rerolled bars to 2.35c. mill for bars from new billets.

Finished Materials.—The market generally is rather dull, orders being small and for immediate shipment. Prices generally are being held to the regularly established levels, but it is no secret that attractive tonnages of bars, shapes and plates, for immediate delivery, would bring out concessions from some mills. In fact, some tonnages of plates for December delivery are reported to have been booked by two of the smaller mills on the basis of 2.40c., Pittsburgh. Some sales of bars are also reported at 2.35c. A firmer tendency is noted in cold-finished materials. Some mills which had been taking business at 2.90c., advanced Saturday to 3c., after booking several nice orders. It is just possible that further advances to 3.15c. may be made within the next few days, as mills are reported to have come to the conclusion that this price will have to be secured in order to make sales profitable at this time. There is little activity in wire products, and reports of price cutting in nails apparently are due to the policy of some independents of equalizing the southern Ohio freight rate into the Cincinnati district. Bolts and nuts continue weak in price with little demand. Specialties continue to move, however, in fair volume, and there is fair interest being shown in light rails and track accessories, although no big orders have been booked.

Structural Material.—The past week was one of the quietest of the year, no lettings being reported and only one inquiry of consequence being received. This was a highway bridge in Kentucky, on which bids will be taken at Frankfort Dec. 10, involving approximately 180 tons.

Warehouse Business.—Numerous orders for small tonnages are being received by local jobbers, but a perceptible falling off is noted generally in the volume of business offering. Wire nails have been reduced 10c. per keg, and cold-finished materials have been cut $5 per ton. Prices of other products remain as last quoted.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets, 5.85c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.50 per keg base; cement coated nails, $3.30 per keg.

Coke.—The coke market is quiet, although some sales for first quarter are being made of New River coke. Connellsville operators apparently are unwilling to sell at present prices for longer than January delivery. Furnace coke is inactive, and domestic is moving only in limited tonnages. We quote prices as follows:

Connellsville furnace, $4.00; foundry, $5.00; New River foundry, $10 to $11; Wise County furnace, $4.75; foundry, $5.75; by-product foundry, $8.00, Connellsville basis.

Old Material.—Dealers continue to make the market on old materials, the consumers in this territory showing little interest in the market. Buying is light. Higher prices offered by dealers have resulted in scrap being more firmly held by producers. Prices are unchanged from last week, though the tendency is to advance.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$10.00 to	$10.50
Iron rails	13.50 to	14.00
Relaying rails, 50 lb. and up	27.50 to	28.00
Rails for rolling	13.50 to	14.00
Heavy melting steel	13.00 to	13.50
Steel rails for melting	13.00 to	13.50
Car wheels	13.00 to	13.50
	Per Net Ton	
No. 1 railroad wrought	11.50 to	12.00
Cast borings	9.00 to	9.50
Steel turnings	8.50 to	9.00
Railroad cast	14.00 to	14.50
No. 1 machinery cast	17.00 to	17.50
Burnt scrap	11.00 to	11.50
Iron axles	21.00 to	21.50
Locomotive tires (smooth inside)	13.00 to	13.50
Pipes and flues	7.00 to	8.50

Boston

Pig Iron Prices Have Strengthened, but Business Is Very Light

BOSTON, Dec. 4—Eastern Pennsylvania and Buffalo pig iron prices have strengthened perceptibly the last few days, but business has dropped almost to the vanishing point. Eastern Pennsylvania is generally on a $26.65 delivered base with 50 cents differentials on No. 2X. One furnace asks $1 differentials on No. 2X. Another, taking an eastern Pennsylvania freight rate, heretofore on a $25.65 delivered base, has withdrawn from the market. A Buffalo furnace taking a large tonnage at $19.50 furnace base during the recent buying flurry advanced to $22 and then withdrew. Another iron maker in that district is up to $22.50 furnace base from $19.50. Early in the past week, a Buffalo steel mill took business in New England at $19.50 furnace, giving buyers a choice of No. 2 plain, No. 2X or No. 1X at that price, but today is on a $22 base. All Buffalo furnaces ask $1 differentials between No. 2X and No. 1X. Lake charcoal iron is $1 a ton higher at $26 furnace for base grades. Regular Virginia and Alabama irons are quoted on last week's basis, and small tonnages moving. With the possible exception of Vir-

ginia, most furnaces selling in New England are reported to have sufficient business on their books to insure activity well into first quarter, 1924. Based on normal business conditions, New England foundries generally will have to buy for late first quarter consumption, for while recent buying of iron was general, it was not heavy in individual cases.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$27.15 to $28.15
East. Penn., sil. 1.75 to 2.25	26.65
Buffalo, sil. 2.25 to 2.75	27.41 to 27.91
Buffalo, sil. 1.75 to 2.25	26.91 to 27.41
Virginia, sil. 2.25 to 2.75	30.92 to 32.42
Virginia, sil. 1.75 to 2.25	30.92 to 31.92
Alabama, sil. 2.25 to 2.75	31.10
Alabama, sil. 1.75 to 2.25	30.60

Coke.—Both the New England Coal & Coke Co. and the Providence Gas Co. have announced by-product foundry coke is $12.50 delivered in New England, the same price at which fuel was billed out in November. Both companies have experienced a smaller demand for domestic fuel than anticipated because of mild weather, are operating ovens at capacity and are actively soliciting specifications against 1923 foundry coke contracts. Foundries generally have sufficient fuel on hand to carry them over the turn of the new year. The local market for foundry coke, therefore, is not as firm as it appears on the surface, although recent developments in the Connellsville region have somewhat strengthened the position of New England producers.

Old Materials.—A further general strengthening in prices, without much improvement in actual business, were the outstanding features in old materials the past week. Quotations on heavy melting steel continue to take an unusually wide spread, with the average up 50 cents this week. Small tonnages for shipment into the eastern Pennsylvania territory at $12 on cars shipping point represent the top of the market, but most dealers cannot quote better than $11 to $11.50. Machine shop turnings are 50 cents higher and the most active material in the market, although mixed borings and turnings are a close second. Small purchases of forged scrap and bundled skeleton have lifted prices 50 cents. Interest in wrought pipe is lacking and quotations unchanged. New England foundries are showing more interest in No. 1 machinery cast, but individual purchases usually are in car lots, inasmuch as most melters are still able to secure adequate supplies from their respective localities at attractive terms.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.00 to $23.00
No. 2 machinery cast	20.00 to 21.00
Stove plate	15.50 to 16.00
Railroad malleable	18.50 to 19.00
Street car wheels	19.00 to 20.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $12.00
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	11.00 to 11.50
Wrought pipe (1-in. in diam., over 2 ft. long)	10.00 to 10.50
Machine shop turnings	7.50 to 8.00
Cast iron borings, chemical	9.50 to 10.00
Cast iron borings, rolling mill	7.50 to 8.50
Blast furnace borings and turnings	7.00 to 7.50
Forged scrap and bundled skeleton	8.00 to 8.50
Shafting	17.00 to 18.00
Rails for rolling	12.50 to 13.00

Dwight P. Robinson & Co., Inc., New York, has opened an office in Atlanta, Ga., in the Healey Building, with W. Rawson Collier in charge. Mr. Collier was for many years with the Georgia Railway & Power Co. He joined the Robinson company several months ago, going from the Poughkeepsie Gas & Electric Co. Among the company's recent activities in the South are a new wet-process cement plant for the Lehigh Portland Cement Co. at Birmingham, Ala.; extensions to the steel plant of the American Rolling Mill Co. at Ashland, Ky.; extensions to the power systems of the New Orleans Public Service, Inc., and the design and construction of the fifth sulphur mining plant built for the Freeport Sulphur Co. at Hoskins Mound, Tex. The company is also arranging to build a 300-room clubhotel at Palm Beach, Fla.

St. Louis

Limited Buying of Pig Iron Follows Activity of Preceding Two Months

ST. LOUIS, Dec. 4.—A pronounced calm pervades the pig iron market this week following the storm of orders that marked the previous fortnight in St. Louis. What little buying there was consisted of carloads for prompt shipment. The buying for next year's melt stopped about the middle of the week. Toward the latter part of the week, a few inquiries were sent out, including 2500 to 3000 tons of basic for a local steel plant; 2000 tons of basic for an Illinois melter; 2500 to 3000 tons of foundry iron for an Illinois melter and scattering inquiries for carloads up to 100 tons, amounting to 500 tons. The market remains at $23, Chicago, for Northern iron, and $21, Birmingham, for Southern make. However, a quotation of $22.50, Chicago, is reported to have been made to melters in this district by a leading Chicago interest. The St. Louis Coke & Chemical Co. is quoting $26, f.o.b. Granite City furnace.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$23.66 to $24.16
Northern malleable, sil. 1.75 to 2.25	23.66 to 24.16
Basic	23.66 to 24.16
Southern fdy., sil. 1.75 to 2.25 (rail)	26.17

Reinforcing Bars.—Considerable interest is being shown here in pending business, which includes:

William Beaumont public high school, St. Louis, 1,000 tons.

McBride Catholic boys' high school, 150 tons.

Grain elevator, Kansas City Southern Railway, Port Arthur, Tex., 300 to 400 tons.

Finished Iron and Steel.—The Wabash purchase of 800 kegs of standard track spikes is the only item of interest to report in railroad material. Warehouses and manufacturers of steel products are buying virtually nothing, nor will they be in the market until after the first of the year.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.70c.; structural rivets, 4.15c.; boiler rivets, 4.35c.; tank rivets, $\frac{7}{16}$-in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, squares or hexagon blank, $2.50; and tapped, $2.50 off list.

Old Material.—The market for old material continues to advance, due entirely to the activity of dealers who have faith in higher prices, which faith remains unshaken despite the decision of the steel plant most active in whatever buying has been going on to close down temporarily on Dec. 15. This concern started to buy for immediate delivery, but it became known during the week that the purchases were made to fill orders on hand before operations ceased. Consumers are buying very little. New railroad lists include: Chicago & Alton, 1000 tons; Chicago, Milwaukee & St. Paul, 1500 tons; Missouri Pacific, 1200 tons; Pennsylvania system: central region, 15,000 tons; northwestern region, 3500 tons; southwestern region, 7500 tons.

Per Gross Ton	
Iron rails	$15.00 to $15.50
Rails for rolling	17.00 to 17.50
Steel rails, less than 3 ft.	17.00 to 17.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 and over	32.50 to 33.50
Cast iron car wheels	17.00 to 17.50
Heavy melting steel	13.75 to 14.00
Heavy shoveling steel	13.75 to 14.00
Frogs, switches and guards cut apart	16.00 to 16.50
Railroad springs	17.50 to 18.00
Per Net Ton	
Heavy axles and tire turnings	12.00 to 12.50
Steel angle bars	13.00 to 13.50
Steel car axles	16.00 to 16.50
Iron car axles	23.75 to 24.00
Wrought iron bars and transoms	18.00 to 18.25
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.50 to 13.00
Cast iron borings	10.00 to 10.50
No. 1 busheling	13.00 to 13.25
No. 1 railroad cast	17.50 to 18.00
No. 1 machinery cast	18.50 to 19.00
Railroad malleable	15.50 to 16.00
Machine shop turnings	9.00 to 9.50
Champion bundled sheets	8.00 to 8.50

Buffalo

Fair Tonnage Placed Following the Recent Heavy Movement

BUFFALO, Dec. 4.—About 40,000 tons of new orders for pig iron have been taken on by producers at the tail end of the buying movement; a considerable portion of this tonnage was booked at upwards of $21 for silicon 1.75 to 2.25. Conflicting statements have been made as to the total amount of new business in the month of November, but THE IRON AGE is able to state that the total volume was less than 300,000 tons. Of course, all factors participated in this tonnage but the greatest portion was handled by three of five merchant furnaces. There is very little activity expected the rest of this month in sales, but shipping is brisk and melters are making every effort to get iron in. Two producers have reached the stage that they do not care to make further commitment and are quoting only on actual inquiries sent to them, and each inquiry is taken up as a separate individual proposition. With one producer all existing prices scheduled have been cancelled and no quotations are being sent out without application. No big inquiry is out. In connection with November sales, most of it was negotiated without the formality of inquiry being made.

We quote f.o.b., gross ton, Buffalo as follows:

No. 1 foundry, sil. 2.75 to 3.25	$22.00
No. 2 foundry, sil. 2.25 to 2.75	21.50
No. 2 plain, sil. 1.75 to 2.25	21.00
Basic	21.00
Malleable	21.00
Lake Superior charcoal	28.28

Finished Iron and Steel.—Demand has fallen off in all lines with a slight exception in sheets for first quarter delivery. One dealer has noticed improvement in this demand and prices are holding firm. A few jobbers have been buying bars in slightly larger quantities, but the whole market is quiet, and is expected to so remain until after the holiday season. Structural work is being rapidly brought to a close and no new jobs have been brought out with the exception of a new addition for the American Locomotive Co. at Schenectady where approximately 1000 tons of shapes will be required.

We quote warehouse prices Buffalo as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold rolled round shafting, 4.45c.

Old Material.—Sales in other districts and livelier interest all around has strengthened this market. Although the two largest users of heavy melting steel have announced that they will not be interested in further propositions until after the first of the year, it is expected that lesser factors will place tonnages within the month.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$16.00
Low phos., 0.04 and under	$20.00 to 21.00
No. 1 railroad wrought	14.00 to 15.00
Car wheels	18.00 to 18.50
Machine shop turnings	10.00 to 11.00
Cast iron borings	12.50 to 13.00
No. 1 busheling	14.00 to 15.00
Stove plate	17.00 to 17.25
Grate bars	16.00 to 16.50
Bundled sheet stampings	10.00 to 11.00
No. 1 machinery cast	18.00 to 19.00
Hydraulic compressed	14.00 to 14.50
Railroad malleable	18.00 to 18.50

Permits were issued in St. Louis during November for building construction to cost $4,571,525, of which $2,000,000 was issued after Nov. 26, when the Missouri Supreme Court declared the St. Louis zoning law unconstitutional, on the ground that it did not provide compensation for real estate values lost in restricted districts. Permits issued in November, 1922, were for work costing $2,850,789.

The Marshall & Huschart Machinery Co., 17 South Jefferson Street, Chicago, will shortly offer for sale the entire equipment of the Harroun Motor Co. plant at Wayne, near Detroit. The machinery, which is appraised at from $200,000 to $225,000, will be disposed of at private sale.

Birmingham

Pig Iron Buying Not Heavy, but Inquiries Are Numerous

BIRMINGHAM, ALA., Dec. 4.—The activity in the Southern pig iron market of two weeks ago is not continuing, spot business, however, aggregating well and furnace interests are not discouraged. Inquiries have been lively and there are indications that another impetus in the buying will start on the turn of the year, if not before. Quotations are around $20 to $21 per ton, No. 2 foundry, with two or three companies not urging the market at that price. The surplus stocks of iron are being cut into, deliveries being prompt where melters desire the product.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon 1.75 to 2.25	$21.00
Basic	21.00
Charcoal, warm blast	33.00

Cast Iron Pipe.—Lettings continue coming in to the cast iron pipe makers, both pressure and soil pipe makers. One statement in pressure pipe circles is that there is no improvement in business. The bond situation, which has failed to improve as much as was expected, it is stated, is seriously hampering municipalities throughout the country in the sale of bonds for public improvement. The United States Cast Iron Pipe & Foundry Co., the National Cast Iron Pipe Co. and the American Cast Iron Pipe Co. are receiving lettings, as stated, week after week. The American Cast Iron Pipe Co. has received an order for 1158 tons from Shreveport, La., 289 tons from Honolulu, Hawaii, and 120 tons from Mobile, Ala. Pipe quotations show no change, 6-in. and over pressure pipe being $49 to $50 while standard soil pipe is quoted at $55. Building operations are steady and as a consequence the soil pipe industry is enjoying a better demand.

Finished Material.—Some of the steel mills of the district, on shapes, are lagging. Rods, wire and nails are in good demand and these mills are producing steadily. The Gulf States Steel Co. has four open-hearth furnaces in operation and the Tennessee company twice as many. Steel bars are still quoted at 2.60c.

Coke.—The Southern coke market is still quiet and production being curtailed. By-product foundry coke is selling at $5 per ton with beehive coke as high as $6 and $6.50. The demand is not showing signs of an early improvement.

Old Material.—No. 1 cast is in better demand but the scrap iron and steel market as a whole is still unsettled. Dealers have been receiving some inquiries and have been selling a little stock.

We quote per gross ton f.o.b. Birmingham district yards, nominal prices, as follows:

Cast iron borings, chemical	$15.00 to $17.00
Heavy melting steel	12.00 to 13.00
Railroad wrought	14.00
Steel axles	19.00 to 20.00
Iron axles	23.00 to 24.00
Old steel rails	16.00 to 17.00
No. 1 cast	17.00 to 18.00
Tram car wheels	18.00 to 19.00
Car wheels	17.00 to 18.00
Stove plate	14.00 to 15.00
Machine shop turnings	5.00 to 6.00
Cast iron borings	8.00 to 9.00

Electrification of the first unit of the Ford railroad, the 13½-mile section of the Detroit, Toledo & Ironton, between the River Rouge Ford plant and Flat Rock, Mich., will be completed next May. Plans are being made for electrification of other sections which will be undertaken soon. At present a single track has been laid while the second track is about 40 per cent completed. Overhead trolleys to carry 23,000 volts alternating current to the locomotives will be ready to put in place when the tracks are finally completed. Eight turbo-generators, each delivering 62,500 hp. will eventually be installed in the River Rouge power house. This means 500,000 hp. will be available for the Ford industries and the D. T. & I.

Cleveland

Fair Tonnage of Pig Iron Sold—Malleable Taken for January-May Delivery

CLEVELAND, Dec. 4.—While the heavy pig iron buying movement has subsided, the market is still fairly active in foundry and malleable grades except in Cleveland and the immediate territory where nearly all consumers are now under contract. Some of the lake and Valley furnaces booked considerable iron during the week. Sales by one lake furnace company aggregated 25,000 tons, the largest lot being 4000 tons of foundry iron, and this producer now has scattered inquiries pending for 10,000 tons. Practically all the business booked is for the first quarter, as neither buyers nor sellers seem inclined to go beyond that period. Lake furnaces that were slower to mark up prices than producers in some other districts have advanced quotations 50c. per ton. One is now quoting foundry and malleable iron at $22.50 to $23 and the latter price at furnace is being quoted for Cleveland delivery, although the $22 Cleveland price for outside shipment has not disappeared. In the Valley district, quotations range from $22 to $22.50. Sales include a 5000-ton lot of malleable iron taken by a Buffalo furnace at $23 for January-May shipment. Some of the business placed during the week came from consumers who previously had bought but have added to their original purchases. Some of the automobile foundries have advised the trade that they expect to buy additional iron early in January as soon as automobile manufacturers begin to release specifications for castings. While consumers, as a rule, have not bought beyond their normal requirements, the question has arisen as to whether foundry business will develop in sufficient volume during the first quarter to assure the taking of the iron in the quantities contracted for. Some of the furnaces have their order books well filled, but others have not been willing to sell their entire output at the prices that have been prevailing. Steel making iron is inactive. Low prices have been named in the East or around $25 for low phosphorus iron for Western shipment. A Pittsburgh consumer is inquiring for 1500 tons of low phosphorus. Ohio silvery producers who recently shaded prices $1 a ton have restored the regular schedule. Southern furnaces are holding firmly to $21 for foundry iron. Perry furnace, Erie, Pa., will go out of blast tomorrow.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$21.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.00 to 23.50
Southern fdy., sil. 1.75 to 2.25	27.00
Malleable	23.00 to 23.50
Ohio silvery, 8 per cent	35.52
Standard low phos., Valley furnace	29.00 to 30.00

Iron Ore.—The shipping season has now closed with one cargo shipped from Marquette this week. The total movement by water for the season was slightly over 59,036,704 tons. A table giving shipments by ports for 1923 appears in another column.

Bolts, Nuts and Rivets.—Bolt and nut makers have stiffened somewhat on prices and it is claimed that the regular discount of 60 and 10 per cent off list on large machine bolts is no longer being shaded. Some first quarter business has been taken at that price. Manufacturers are getting their low priced steel used up and with regular prices generally holding on steel bars, they feel that they are entitled to better prices. The same situation has caused rivet makers to stiffen on prices. The leading local manufacturer advanced rivets Nov. 28 to 2.90c. base and small rivets to 65, 10 and 5 per cent off list, and it is understood that other rivet makers will hold to these prices, but they have not yet been tested.

Reinforcing Bars.—The demand has slowed down and prices are irregular. On soft steel bars, quotations of 2.30c. are appearing. Prices on rail steel bars range from 2.10c. to 2.20c.

Semi-Finished Steel.—An Ohio consumer has purchased 5000 tons of sheet bars from a Valley mill for the first quarter at $42.50, which price is being firmly held. Sheet bar specifications show an improvement. There is no activity in billets and slabs.

Sheets.—A moderate volume of business is being placed in first quarter contracts, but current demand is light. Mills have taken a firmer price attitude and there is now little shading of regular prices, although black sheets may still be had at 3.75c. for December rolling and galvanized at 4.90c. out of stock.

Finished Iron and Steel.—There is an improvement in sentiment in the steel industry and some producers report a slight increase in orders and inquiries, but sales are almost wholly in small lots and the aggregate tonnage booked during the week was light. Consumers have allowed their stocks to become very low as inventory time approaches, many being no doubt influenced to some extent by a feeling that prices may go lower. Some producers express the opinion that unless there is more activity in steel bars before the end of the month, a buying spurt will develop in January in such volume that consumers will be disappointed in getting as early deliveries as they will need. A few inquiries for steel bars for the first quarter have come out, but little business has been placed for that delivery, although several of the mills are ready to take first quarter contracts at regular prices. Automobile companies are withholding first quarter purchases although they are expected to need considerable steel in January. Pittsburgh district mills are holding firmly to 2.40c. for steel bars and 2.50c. for plates and structural material. However, the irregularity in plates continues, attractive inquiries bringing out a 2.40c. price. While most of the steel bar business is being taken at the regular price, this is still being shaded from $1 to $2 a ton by one or more small mills and as low as 2.25c. is reported to have been the price made on 800 tons placed by an Ohio consumer. Cold-finished steel bars have firmed up and makers now appear to be holding closely to 3c. A lull exists in the building field. While considerable work is pending, contracts are being placed rather slowly and little new inquiry is coming out.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.60c. to 5.80c.; No. 10 blue annealed sheets, 3.60c. to 4c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, $3.50 per 100 lb.; No. 9 galvanized wire, $3.95 per 100 lb.; common wire nails, $3.60 base per 100 lb.

Coke.—Producers are renewing contracts for Wise County foundry coke at $6.75 for the first half. Connellsville coke is moving slowly with quotations unchanged at $5.25 to $6.50 for standard foundry grades.

Old Material.—The buying of heavy melting steel in Pittsburgh by the Carnegie Steel Co. has caused dealers to jump into the market and cover short sales and has resulted in price advances of from 50c. to $2 a ton. Local dealers have paid $16 to $16.50 delivered to Cleveland mills for heavy melting steel, $12.75 for machine shop turnings and $13.50 for shoveling turnings. However, mills have failed to become excited over the advancing market and the week brought out very little business from consumers. Local mills still have large stocks. Some feel that there may be a slight reaction from present prices.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$16.00 to $16.50
Rails for rolling	16.25 to 16.75
Rails under 3 ft	16.75 to 17.00
Low phosphorus melting	18.00 to 18.50
Cast borings	13.00 to 13.25
Machine shop turnings	12.25 to 12.75
Mixed borings and short turnings	13.00 to 13.25
Compressed sheet steel	13.00 to 13.50
Railroad wrought	14.50 to 15.00
Railroad malleable	19.75 to 20.00
Light bundled sheet stampings	11.00 to 11.25
Steel axle turnings	13.50 to 14.00
No. 1 cast	20.50 to 21.50
No. 1 busheling	12.00 to 12.50
Drop forge flashings	12.00 to 12.50
Railroad grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Pipes and flues	12.00 to 12.25

Philadelphia

After Another Week of Fair Activity Pig Iron Market Turns Quiet

PHILADELPHIA, Dec. 4.—The tail-end of the first quarter buying movement in pig iron was practically wound up last week, so far as the large tonnages are concerned. Some of last week's business was taken at slightly below today's levels of prices on quotations of one or two weeks' standing. The market is quieter, but some of the smaller consumers are covering on the basis of $23, furnace, which all of the Eastern producers are now quoting. The real event of the week was the sharp rise in scrap prices, almost every item being affected. The market's strength was due largely to the purchase of a tonnage of heavy melting steel by the Carnegie Steel Co. at Pittsburgh at $19, delivered. In finished steel the situation shows no marked change, nor is any expected until after the first of the year. A slight increase in bookings in November over October has given rise to a moderate degree of optimism, but there is little of a tangible character upon which to base the sanguine hopes expressed by some in the steel trade.

Pig Iron.—Considerably more tonnage for first quarter shipment was taken by a few of the Eastern furnaces the middle of last week, but during the last two days of last week and the first two days of this week the market has been much quieter, which may indicate that the first quarter buying movement has virtually subsided so far as the large tonnages are concerned. Some of the smaller consumers are covering, and in the aggregate their orders have given two or three furnaces a fair volume. Current business is being taken by all of the Eastern companies at $23, furnace, with 50c. differentials for each higher grade of silicon. Less is now being heard of merchant furnaces going out of blast. The Brooke furnace will go in blast about Jan. 1 and is now taking contracts for first quarter. The past week's business did not include any basic iron, but 6000 to 8000 tons of gray forge was sold, one buyer of 6000 tons paying about $23.25, delivered, while another buyer of upward of 1000 tons paid $23, delivered. Fair-sized sales of low phosphorus iron have been made at unchanged prices. Makers of malleable iron are now quoting $23.50, furnace, or higher.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$23.76 to $24.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 24.63
East. Pa. No. 1X	24.76 to 25.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 30.67
Basic delivered eastern Pa.	22.75 to 23.00
Gray forge	23.00 to 23.50
Malleable	24.25 to 24.50
Standard low phos. (f.o.b. furnace)	27.50 to 28.00
Copper bearing low phos. (f.o.b. furnace)	28.00

Ferroalloys.—There has been a good buying movement in ferromanganese during the past week, 6000 to 8000 tons for first quarter having been contracted for by a number of consumers. The lowest price reported is $106.50, furnace, but other sales ranged from this price up to $109. One producer is now quoting $108 to $109, furnace, while another has advanced its price to $115, furnace.

Coke.—Connellsville coke is slightly firmer, spot shipments not being so easily obtained at $4, some producers quoting $4.25. First quarter contracts have been made at $4.40 and $4.50. Foundry coke is quoted at $5 to $5.25, Connellsville.

Semi-Finished Steel.—While $40 for open-hearth rerolling billets and $45 for forging billets remain nominally the market quotations, contracts for first quarter or spot business in good-sized lots could probably be closed at concessions. There is not enough business to test prices.

Plates.—A slight increase in plate bookings in November over October is the most cheering news Eastern plate mills can offer. The plate market is still exceedingly quiet and the price situation is unchanged, Eastern mills quoting 2.40c. and Pittsburgh mills 2.50c., Pittsburgh.

Structural Material.—One or two Eastern shape mills which have held to 2.50c., Pittsburgh, on plain material have met in a few instances the 2.40c. quotations of two smaller Eastern mills. Very little tonnage is coming out in this district, building work being very quiet.

Bars.—Steel bar mills report no difficulty in getting 2.40c., Pittsburgh, on such orders as are being placed, notwithstanding frequent rumors of 2.30c. and 2.35c. quotations. Bar iron is not in demand and Eastern mills generally quote 2.35c., Pittsburgh.

Sheets.—Prices are firmer than a few weeks ago, but some shading of so-called regular prices is still reported, especially for shipments this month. For first quarter most of the mills are said to be holding firmly to 3c. for blue annealed, 3.85c. for black and 5c. for galvanized.

Warehouse Business.—Despite slight shading of prices by some of the warehouses in this district, most of the Philadelphia jobbers hold to the prices named below for local delivery.

Soft steel bars and small shapes, 3.47c.; iron bars (except bands), 3.47c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.57c.; tank steel plates, ⅜ in., 3.82c.; blue annealed steel sheets, No. 10 gage, 4.10c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.57c.; structural shapes, 3.57c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.27c.; narrower than 1 in., all gages, 4.77c.; steel bands, No. 12 gage to ⅛-in., inclusive, 4.27c.; rails, 3.47c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—A purchase of heavy melting steel at $19 by the Carnegie Steel Co. has affected the scrap situation of the entire East. Coming after a prolonged period of inactivity and low prices, this purchase has had the effect of buoying the hopes of dealers for higher prices. Philadelphia brokers are freely offering $16, delivered, for No. 1 heavy melting steel, and one large company, it was reported today, was prepared to offer $16.50 for a large tonnage. Scrap brokers believe the eastern Pennsylvania market is headed for $18, and $17 was their idea today of a price at which it would be safe for them to sell. Almost all grades of scrap have moved upward and indications today were that there would be further advances before the end of the week. The sharpest advances have occurred in cast-iron car wheels, forge fire scrap, bundled sheets, machine shop turnings and heavy breakable cast.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$16.00 to $17.00
Scrap rails	16.00 to 17.00
Steel rails for rolling	17.00 to 18.00
No. 1 low phos. heavy 0.04 and under	21.00 to 22.00
Couplers and knuckles	19.00 to 20.00
Cast-iron car wheels	19.50 to 20.00
Rolled steel wheels	19.00 to 20.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	16.00 to 17.00
No. 1 forge fire	13.50 to 14.50
Bundled sheets (for steel works)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	11.50 to 12.00
Machine shop turnings (for steel works use)	13.00 to 13.50
Machine shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mills)	13.00 to 13.50
Cast borings (for chemical plants)	15.00 to 16.00
No. 1 cast	20.00 to 21.00
Heavy breakable cast (for steel plants)	17.50 to 18.00
Railroad grate bars	17.00 to 17.50
Stove plate (for steel plant use)	16.50 to 17.00
Railroad malleable	17.00 to 17.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 15.50
Shafting	21.00 to 22.00
Steel axles	20.00 to 21.00

San Francisco

Gradual Improvement in Demand for Iron and Steel Products

SAN FRANCISCO, Nov. 27—The trade outlook for iron and steel business is gradually developing some improvement. While the betterment is still of very moderate proportions, it possesses some definite features which the trade feels assured will continue, particularly if the Eastern markets show tangible indications for advanced prices and sufficient business to maintain a higher standard of market values. The improvement in this market is based on two underlying causes, the chief one being a better buying inquiry coupled with an increased volume of orders for delivery during the next three or four months.

Pig Iron.—Sales for November were decidedly light but the past ten days or so have developed a fair measure of business, so that the record for the month will make a better showing than was expected. Business is still described as very dull but there has ben sufficient change to encourage sellers that the next three months will be considerably better than the last three. The quotable price is still $33 to $34 per ton and firmly held, with some indications that a slight advance may be expected if conditions in the East strengthen prices there. Imports have been light and among the arrivals by sea were several small lots from China. Several other small parcels are on the way from the Orient to arrive during the coming month. The inquiry in the southern part of the State continues good with every indication that business volume will continue to increase.

Coke.—There is not much trade movement and supplies, while not very extensive, are nevertheless ample for all requirements. Arrivals have been light but there is some en route due to arrive within the next 30 days. Prices are a trifle stronger and desirable stock is now held at $22 to $22.50 per ton.

Finished Steel and Iron.—With a moderate increase in orders, both mills and foundries are more actively engaged now than for some weeks. Prices show little change, but there is a hardening tendency noticeable on materials. Merchant bars are slightly higher now, selling at $3.75 and small lots at $4. The demand for structural steel shows improvement and while the last quoted figures are still current, it is doubtful if the most favored buyer could obtain any concession on asking figures. It is stated that there is sufficient work now in sight and being planned to keep the present inquiry well sustained for several months, not alone in the Los Angeles district but in the district around San Francisco bay.

Old Material.—Business is reported as slightly better, but buyers are giving out orders very sparingly, and the Los Angeles mills are said to be out of the market for the remainder of the year. Prices are held at $14 to $14.50, but it would have to be an extra good lot to bring the latter figure. November was the most quiet month in the past two years, but indications for December are more encouraging than since last spring.

A Carbon Monoxide Recorder

A CO recorder for use either as a separate instrument or as an adjunct to its CO_2 recorder has been placed upon the market by the Uehling Instrument Co., Paterson, N. J. The CO_2 instrument tells when there is too much air and the CO recorder indicates when there is too little. Using the two instruments together the fireman can make adjustments that will permit of saving fuel for a given boiler.

In the CO recorder there are two electrically-heated platinum tubes of small bore through which the gas sample flows continuously. If CO or other combustible gas is present it will burn within the first heated tube and increase the temperature of that tube more or less according to the amount of combustible present. The burnt gas then flows through the second platinum tube and out of it under a fixed suction.

The hotter the first tube becomes the more expanded will be the gas flowing through it and consequently less gas will enter the chamber connecting the two tubes as the first tube becomes hotter. The outlet suction does not vary, and hence a decreasing flow of gas through the first tube results in a greater partial vacuum in the connecting chamber. The varying suction in the connecting chamber becomes a measure of the heat units in the gas, and by connecting the chamber with a recording gage by means of tubing the quantity of combustible may be recorded at a distance.

The recorder is calibrated in percentage of CO. If hydrocarbons or hydrogen are present they will also be recorded in terms of CO or equivalent heat value. It is also feasible to calibrate the instrument in B.t.u. per cu. ft. of gas. An auxiliary indicator may be mounted on its boiler front to guide the fireman.

A leak is provided near the gas inlet which dilutes the gas with air by a definite small amount, assuring sufficient oxygen to complete combustion in the first tube. The suction regulator on the CO instrument is of simple design. It has a tube, open to the air, which extends into the water almost to the bottom of the water container. Part of the gas entering the instrument is by-passed through a pipe, bubbling up through the water in the container and escaping through a pipe at the top which leads to the outlet. This pipe communicates with an aspirator or main suction through a needle valve.

COMING MEETINGS

December

National Exposition of Power and Mechanical Engineering. Dec. 3 to 8, inclusive. Second annual exposition, Grand Central Palace, New York. Headquarters, Grand Central Palace, New York.

American Institute of Chemical Engineers. Dec. 5, 6, 7 and 8. Winter meeting in Washington, D. C. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y., secretary.

National Immigration Conference. Dec. 13 and 14. Hotel Astor, New York. Magnus W. Alexander, 10 East Thirty-ninth Street, New York, managing director.

January

Society of Automotive Engineers. Jan. 22 to 25. Annual meeting, General Motors Building, Detroit. Coker F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

American Society for Steel Treating. Jan. 31 to Feb. 1. Winter sectional meeting, Rochester, N. Y. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

Passing upon a complaint of the Homer Furnace Co., operating a foundry at Coldwater, Mich., the Interstate Commerce Commission recently handed down a decision holding that the rate of pig iron from Toledo, Ohio, to Coldwater for the future may not exceed $2.24 per ton, subject to the 10 per cent general rate reduction of July 1, 1922.

The Pittsburgh *Gazette Times*, in a column quoting important news developments from its files of other years, recently noted that 40 years ago the Carnegie Steel Co. reduced wages at its Homestead plant from $1.40 to $1.20 per day of 10 hours. Today's rate for common labor at this and other Steel Corporation plants is $4.40 for a day of 10 hours.

British Iron and Steel Market

Japanese Demand Slight—Improvement in Steel Follows Boilermakers' Settlement—Ruhr Efforts to Resume Hampered by Lack of Funds

(By Cable)

LONDON, ENGLAND, Dec. 4.

Pig iron is firm on increasing domestic demand and Cleveland output is expanding. Foreign inquiry is rather quiet. Hematite is strong, with diminished supplies for first quarter delivery. It has been sold up to £5 2½s. ($22.24). Additional furnaces have been restarted. The total number of Cleveland furnaces now blowing is 44, comprising 14 on foundry and forge iron, 14 on hematite and 16 on basic iron.

Foreign ore is firmer on rising freight rates. Sellers of Bilbao Rubio ask 24s. to 24½s. ($5.21 to $5.32) c.i.f. Tees.

Steel is firm, with increased demand for ship plates, following on the releasing of contracts held up by the boilermakers' dispute. The demand is mainly for domestic requirements but there is some inquiry from Germany. Merchant steel is quiet, with prices unchanged.

Continental sterling quotations are weaker on exchanges but sales are only meager, owing to the uncertainty of the general position. Wire rods are being quoted at £9 5s. to £9 7½s. ($40.14 to $40.69) f.o.b. German plates have been offered by second-hand dealers at £10 (1.94c. per lb.) f.o.b. for 1 to 3 mm. (No. 20 to 12 gage) and £9 (1.74c. per lb.) f.o.b. for 3 to 5 mm. thickness (No. 12 to 6½ gage), all for shipment in 14 days.

On the Continent the Ruhr works are making efforts to resume operations, now that the general agreement has been signed with the French authorities. The workers generally are not yet agreeable to accept the 10-hr. day. The works in many cases are finding difficulty in starting up, owing to shortage of funds.

Tin plate is strong on continued all-round demand, with sellers over the minimum prices of 24s. ($5.21) basis IC f.ob. being done freely. Export sales are good, especially to the Continent, with Scandinavia in the lead. Germany is inquiring. A small oil plate order for January to March delivery has been placed in Wales on the basis of the schedule price. All kinds of wasters are in short supply. Basis prices again are being talked higher on increasing costs.

Galvanized sheets are quiet but prices are steady, the works being well placed. The South Durham Steel & Iron Co., Ltd., Stockton-on-Tees, is arranging to erect a plant to roll galvanized corrugated sheets.

Japanese demand for black sheets now is confined to small parcels and early shipments. The works are committed well forward. Prices are unchanged.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.34 per £1, as follows:

Durham coke, delivered	£1	18½s.	to £1	19s.	$8.35 to	$8.46
Bilbao Rubio ore†	1	4			5.21	
Cleveland No. 1 foundry	5	7½			23.33	
Cleveland No. 3 foundry	5	0			21.70	
Cleveland No. 4 foundry	4	19			21.48	
Cleveland No. 4 forge	4	18			21.27	
Cleveland basic	5	0			21.70	
East Coast mixed	5	1½ upward			22.03 upward	
East Coast hematite	4	19	to 5	0	21.48 to	21.70
Ferromanganese	17	0			73.78	
Ferromanganese*	17	0			73.78	
Rails, 60 lb. and up	8	10	to 9	10	36.89 to	41.23
Billets	8	0	to 8	10	34.72 to	36.89
Sheet and tin plate bars, Welsh	8	18¾			38.79	
Tin plates, base box	1	3½	to 1	4¼	5.10 to	5.26
					C. per Lb.	
Ship plates	9	10	to 10	0	1.84 to	1.94
Boiler plates	13	0	to 13	10	2.52 to	2.62
Tees	9	15	to 10	5	1.89 to	1.99
Channels	9	0	to 9	10	1.74 to	1.84
Beams	8	15	to 9	5	1.70 to	1.79
Round bars, ¾ to 3 in.	10	5	to 10	15	1.99 to	2.08
Galvanized sheets, 24 g.	£19	0s.	to £19	5s.	3.68 to	3.73
Black sheets, 24 gage	14	0			2.71	
Black sheets, Japanese specifications	15	5			2.95	
Steel hoops	12	0	& 12	10*	2.32 &	2.42*
Cold rolled steel strip, 20 gage	17	12½			3.42	
Cotton ties, Indian specifications	15	0			2.91	

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Nominal)

Foundry pig iron:						
Belgium	£4	12½s.	to £4	15s.	$20.07 to	$20.61
France	4	12½	to 4	15	20.07 to	20.61
Luxemburg	4	12½	to 4	15	20.07 to	20.61
Billets (nominal):						
Belgium	6	7½			27.67	
France	6	7½			27.67	
Merchant bars:					C. per Lb.	
Belgium	7	10	to 8	0	1.45 to	1.55
Luxemburg	7	10	to 8	0	1.45 to	1.55
France	7	10	to 8	0	1.45 to	1.55
Joists (beams):						
Belgium	7	0	to 7	2½	1.36 to	1.39
Luxemburg	7	0	to 7	2½	1.36 to	1.39
France	7	0	to 7	2½	1.36 to	1.39
Angles:						
Belgium	8	0	to 8	5	1.55 to	1.60
¼-in. plates:						
Belgium	8	0	to 8	2½	1.55 to	1.57
Germany	8	0	to 8	2½	1.55 to	1.57
⅜-in. plates:						
Luxemburg	8	0	to 8	2½	1.55 to	1.57
Belgium	8	0	to 8	2½	1.55 to	1.57

More Active Pig Iron Market—Extensive Railroad Buying

LONDON, Nov. 15.—The shadow of the impending general election has so far had little adverse effect upon the markets. The recent rise in pig iron prices has brought in some very good buying, more especially on the part of home consumers, rather than for export, the former realizing that they cannot hope for cheaper values for some time to come. Purchases have been made for deliveries spread well over the first quarter, and in some cases the first half, of next year, and makers are now in a better position than they have been for some time past, as the stocks of Cleveland material, at any rate, have rapidly diminished. Some various substantial contracts for steel material have been placed recently, and this has led pig iron manufacturers to expand output, and so far two furnaces are being restarted, and it is probable that a third will be put into blast shortly. Hematite has joined in the improved demand, and here, too, sales have been made up to June, prices being very firm with an upward tendency.

In finished iron and steel the most interesting feature recently has been the publishing of programs by the various railroad companies, which will involve considerable sums of money as well as employment for some little time to come. The Southern Railway contemplates spending about £8,000,000 on electrification, and it is reported that all the work will be placed with British suppliers. The North Eastern Railway is spending about £4,000,000 on new locomotives and cars. Apart from these, some good orders for rails have been secured for colonial markets, while the Admiralty have placed contracts for structural material. Shipbuilding is still in the doldrums, due to the continuation of the boiler makers' dispute. Further conferences have been held from time to time, but the actual result is an adjournment mainly due to the obstinacy of both sides. This dispute is now in its twenty-ninth week and has caused complete paralysis to the ship yards in Scotland.

Export buying has not been particularly brisk, except in the case of specialties. Tin plates are booming and some makers have sold out to June. Galvanized sheets have been in strong demand mainly for the Far East, and the same is the case with black sheets. The orders in general for heavy materials are still lacking.

The Steinhart gas combustion system is to be applied to the steam boilers at the Lackawanna and Johnstown plants of the Bethlehem Steel Co. and to boilers at the plant of the Trumbull-Cliffs Furnace Co., Warren, Ohio.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.50c.

Structural Materials

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.10c. to 3.15c.
Double refined iron bars, base, per lb.....4.75c.
Stay bolt iron bars, base, per lb.....7.75c. to 8c.

Hot-Rolled Flats

Hoops, base, per lb.....3c.
Bands, base, per lb.....3c.
Strips, base, per lb.....3c.

Cold-Finished Steels

Bars and shafting, base, per lb.....3c.
Bars, S. A. E. Series, No. 2100.....4.75c.
Bars, S. A. E. Series, No. 2300.....6.25c. to 6.50c.
Bars, S. A. E. Series, No. 3100.....5.25c. to 5.50c.
Strips, base, per lb.....4.90c. to 5.00c.

Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Bale ties, carloads to jobbers.....75 and 2½ per cent off list
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, all sizes, cut threads..60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....60 per cent off list
Lag bolts .....65 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads...50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in., 50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. nuts, blank.....4.25c. off list
Hot pressed nuts, tapped.....4.25c. off list
C.p.c. and t. square or hex. nuts, blank.....4.00c. off list
C.p.c. and t. square or hex. nuts, tapped.....4.00c. off list
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....80 and 5 per cent off list
⅞ in. and larger, U. S. S.....75 and 5 per cent off list
Small sizes, S. A. E.....80, 10 and 5 per cent off list
S. A. E., ⅞ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Turnbuckles, with ends, ½ in. and smaller, 50 to 55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller, 65 and 5 to 70 and 10 per cent off list
Washers .....5c. to 5.25c. off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.80	$4.80	⅝-in.	$15.00	$15.00
⅜-in.	5.50	6.00	⅝-in.	19.50	20.00
⅜-in.	6.50	7.00	¾-in.	28.50	28.50
½-in.	9.00	9.50	⅞-in.	37.00	37.50
½-in.	11.00	11.50	1-in.	58.50	60.50

Larger sizes—Prices on application.

Cap and Set Screws

Milled square and hex. head cap screws....70 per cent off list
Milled set screws.....70 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....75 and 10 per cent off list
Milled studs .....50 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.90
Small rivets .....65, 10 and 5 off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....$3.00 to $3.15
Spikes, ½ in., 7/16 in. and ⅜ in., per 100 lb..... 3.15 to 3.25
Spikes, ⅓ in..... 3.15 to 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.50
Track bolts, ¾ in. and larger, base, per 100 lb.. 4.00 to 4.25
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 5.00 to 5.50
Tie plates, per 100 lb..... 2.55 to 2.60
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3	61	50½
¼ to ⅜	47	30½	¼ to ⅜	+19	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1½	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+13
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 3
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	3 and 3¼ in.	36
1¼ and 1½ in.	47	3½ and 3¾ in.	37
1¾ in.	31	4 in.	41
2 and 2¼ in.	22	4½ in. and 5 in.	33
2½ and 2¾ in.	32		
Hot Rolled			
3 and 3¼ in.	38	4 in.	43
3½ in. and 3¾ in.	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage	15	2¼-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1½-in. O.D. 9 gage	15
2¼ in. O.D. 12 gage	17	5⅝-in. O.D. 9 gage	55
2¼-in. O.D. 11 gage	18	5½-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.00	20-lb. coating I. C.	$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.90c. to 3c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.75c. to 3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....5.35c.

Galvanized

No. 28 (base), per lb.....4.85 to 5c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Mesabi Bessemer, 55 per cent iron	6.20
Mesabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	11.00c.
Iron ore, Swedish, average 66 per cent iron	10.50c.
Manganese ore washed, 51 per cent manganese, from the Caucasus, nominal	41c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	38c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.25 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$107.50 to $110.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	110.00
Ferrosilicon, 50 per cent, delivered	80.00 to 82.50
Ferrotungsten, per lb. contained metal	88c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent	$40.00
Spiegeleisen, domestic, 16 to 19 per cent	39.00

Ferrosilicon, Bessemer, 10 per cent, $41.50; 11 per cent, $44; 12 per cent, $46.50.

Silvery iron, 6 per cent, $30.00; 7 per cent, $31.00; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39.00; 12-per cent, $41.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	23.50

Per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$42.00 to $45.00	$37.00 to $42.00
Maryland	47.00	42.00
Ohio	42.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00

Silica Brick:	
Pennsylvania	42.00
Chicago	49.00
Birmingham	50.00
Ground silica clay, per net ton	8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00
Chrome Brick:	
Standard size, per net ton	50.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$40.00
Rolling billets, 2-in. and under	40.00
Forging billets, ordinary carbons	45.00
Sheet bars, Bessemer	42.50
Sheet bars, open-hearth	42.50
Slabs	$40.00
Wire rods, common soft, base, No. 5 to ¼-in.	51.00
Wire rods, common soft, coarser than ¼-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.35c. to 2.40c.
Skelp, sheared, per lb.	2.35c. to 2.40c.
Skelp, universal, per lb.	2.35c. to 2.40c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, lb.	2.25c.
Rails, light, rerolled, base, per lb.	1.85c. to 2.00c.
Spikes, ⅝-in. and larger, base, per 100 lb.	$3.00 to $3.15
Spikes, ½-in. and smaller, base, per 100 lb.	3.15 to 3.25
Spikes, boat and barge, base, per 100 lb.	3.25 to 3.50
Track bolts, ⅝-in. and smaller, base, per 100 lb.	4.00 to 4.35
Track bolts, ¾-in. and larger, base, per 100 lb.	4.50 to 5.00
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb., Chicago mill	2.40c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rails, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Ground shafting, base, per lb.	3.40c.
Cut nails, base, per keg	$3.15 to $3.25

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100*(1½% Nickel, 10 to 20 per cent Carbon)	$3.50
2300 (3½% Nickel)	5.00 to 5.25
2500 (5% Nickel)	7.75 to 8.00
3100 (Nickel Chromium)	4.00 to 4.25
3200 (Nickel Chromium)	5.75 to 6.00
3300 (Nickel Chromium)	8.00 to 8.25
3400 (Nickel Chromium)	7.00 to 7.25
5100 (Chromium Steel)	3.75
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.75 to 5.00
6100 (Chromium Vanadium spring steel)	4.50 to 4.75
9250 (Silico Manganese spring steel)	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.00 to 5.25
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton; on billets smaller than 2½-in. sq., the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43	*Pacific Coast	$1.15
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705	Birmingham	0.58
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60	Memphis	0.56
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735	Jacksonville, all rail	0.70
New York, export	0.255	Indianapolis	0.31	Omaha (pipe)	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Chicago	0.34	Denver	1.26	New Orleans	0.67
Boston, export	0.255			†Denver (pipe)	1.17		

*Applies minimum carload 30,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

FABRICATED STEEL BUSINESS

Awards Over 27,000 Tons, Mostly in the East—Prospects Good

Another good week in the volume of bookings in fabricated steel work called for upward of 27,000 tons, of which 20,000 was placed in the East, mostly for private enterprises. Fresh inquiries fell to less than 10,000 tons, but in the first half of 1924 fully 50,000 tons is expected in school buildings for New York. Awards include:

Pictorial Review building, Ninth Avenue at Thirty-third Street, New York City, 12,000 tons to Levering & Garrigues Co.

Barber Asphalt Paving Co., tanks at Maurer, N. J., 300 tons, to Phoenix Iron Works, Meadville, Pa.

Bellamose Corporation, factory building near Hartford, Conn., 700 tons, to American Bridge Co.

State of New Jersey, highway bridge at Point Pleasant, 200 tons, to Phoenix Bridge Co.

Adirondack Power Co., power plant addition in northern New York, 150 tons, to Blaw-Knox Co.

Loft building, West Thirty-fifth Street, New York, 1300 tons, to Hay Foundry & Iron Works.

Lefcourt-Marlborough Building, Broadway at Thirty-sixth Street, New York, 4500 tons; award expected this week, probably to Taylor-Fichter Steel Construction Co.

John A. McCarthy, garage, New York, 400 tons, to Hay Foundry & Iron Works.

S. & L. Building Co., apartment building at Broadway and Eighty-third Street, New York, 1150 tons, to Hay Foundry & Iron Works.

Seventh Avenue and Thirty-fifth Street Corporation, loft building at that address, New York, 4300 tons, to Levering & Garrigues Co.

Highway bridge over Missouri River, Wheeler, S. D., superstructure, 1070 tons, to American Bridge Co.; substructure, 292 tons, to Pittsburgh-Des Moines Steel Co.

Goodman Mfg. Co., addition to assembling building, Chicago, 328 tons, to Bethlehem Steel Co.

Fifty additional shaft sets for No. 4 shaft, Eureka Mine, Ramsey, Mich., Castile Mining Co., 120 tons, to American Bridge Co.

Chicago, Milwaukee & St. Paul bridge and through truss span, 174 tons, to American Bridge Co.

Timken Roller Bearing Co., Canton, Ohio, factory addition, 300 tons, to Canton Bridge Co.

Standard Seamless Tube Co., addition, Economic, Pa., 200 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Bing & Bing, apartment building, Forty-fifth Street, New York, 1000 tons.

Pennsylvania Railroad, machine shop at Olean, N. Y., 150 tons.

New Jersey Zinc Co., building at Palmerton, Pa., 300 tons.

Bureau of Yards and Docks, Navy Department, tanks at Mare Island, Cal., 500 tons.

Turl Engineering Works, tanks to be erected at Peekskill, N. Y., 300 tons.

Loft Building, Thirty-seventh Street, New York, 1000 tons; also another loft building in the same district, 1000 tons.

Public schools Nos. 36, 71 and 121, New York, about 1300 tons each.

Apartment building, Park Avenue and Seventy-ninth Street, New York, 600 tons.

Bakery building in Queens borough, New York, 700 tons.

Mead-Morrison Mfg. Co., Chicago, ore bridge trestle, Youngstown, 150 tons.

Kentucky Highway Commission, bridge at Pineville, 180 tons, bids close Dec. 10.

The Lyon fair will hold its next meeting in Lyon, France, from March 3 to 17, 1924. American manufacturers, especially those who specialize in labor saving devices and machinery, are invited to participate. Emile Garden is official delegate of the fair for the United States, with headquarters at 50 Church Street, New York.

RAILROAD EQUIPMENT BUYING

Orders for 3500 Cars and Inquiries for 3757—Repair Business

Developments of the week in the railroad equipment market include orders by the Southern and the Baltimore & Ohio for 3000 cars and inquiries for upward of 3700 cars, mostly for refrigerator lines, besides noteworthy activity in repair business. The principal items are given below.

The railroads on Nov. 15 had the smallest number of freight cars in need of repair they have had in years. On that date they totaled 149,192, or 6½ per cent of the ownership. Of the total number, 116,534 were in need of heavy repair. The number of freight cars in need of repair on Nov. 15 was a decrease of 66,819 compared with the number on Jan. 1 this year, at which time there were 216,011.

The Baltimore & Ohio Railroad has ordered 1000 70-ton steel gondolas from the Bethlehem Steel Co. to be built at the Cambria works at Johnstown, Pa.

The Lehigh Valley Railroad has contracted with the American Car & Foundry Co. for the repair of 200 gondolas.

The Great Northern Railway will build in its own shops 500 stock cars for which it recently inquired among car builders.

The Missouri Pacific Railroad has placed an order with the Sheffield Car & Equipment Co. for the repair of 1000 box cars.

The Norfolk & Western Railroad is asking for bids on the repair of 1000 57½-ton hopper cars.

The Wabash Railroad is expected to place orders this week for 1750 box cars and 250 gondolas, for which it inquired some weeks ago.

The Southern Railway has placed 2000 steel center sill 40-ton box cars with the American Car & Foundry Co. in addition to 1000 placed with the same builder a week ago.

The Southern Pacific has finally put out an inquiry for 3057 refrigerator cars for the Pacific Fruit Express.

The Western Pacific is asking for figures on 500 refrigerator cars for the Western Refrigerator Line. The same road is in the market for 10 locomotives and 200 50-ton automobile cars.

The Baltimore & Ohio has decided not to buy 50 coaches and 4 dining cars.

The New York Central is inquiring for 500 flat car bodies and 500 stock car bodies.

The Universal Portland Cement Co. has decided not to buy 50 70-ton hopper cars.

The Southern Railway placed 1000 center constructions with the Virginia Bridge & Iron Works.

The Chesapeake & Ohio is inquiring for 25 steel underframes for caboose cars.

Detroit Scrap Market

DETROIT, Dec. 4.—The market on old material has shown a tendency to follow the turn of the pig iron market during the past week, the grades of scrap most in demand registering advances from $1 to $2 per ton. Dealers predominated in the bidding on the offering of one of the largest producers of approximately 3000 tons of turnings, borings, registered hydraulic compressed, flashings and heavy melting steel for December delivery.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast which are quoted on a net ton basis:

Heavy melting steel	$13.50 to $14.50
Shoveling Steel	13.50 to 14.50
Borings	10.00 to 11.00
Short turnings	10.00 to 11.00
Long turnings	9.00 to 9.50
No. 1 machinery cast	17.00 to 18.00
Automobile cast	23.50 to 24.00
Hydraulic compressed	11.00 to 11.50
Stove plate	15.00 to 16.00
No. 1 bushelings	10.00 to 11.00
Sheet clippings	8.25 to 8.75
Flashings	10.50 to 11.00

A McKee patented revolving distributor is to be installed on No. 3 blast furnace of the Cambria plant, Johnstown, Pa., of the Bethlehem Steel Co. by Arthur G. McKee & Co. The new equipment includes all parts of the distributer proper and also a new cast steel gas seal.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Nov.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
28.....	13.25	12.87½	47.50	7.00	6.80	6.72½	6.37½
30.....	13.25	12.87½	47.25	7.00	6.80	6.72½	6.37½
Dec.							
1.....	13.25	12.87½	....	7.00	6.80	6.72½	6.37½
3.....	13.25	12.87½	47.25	7.10	6.90	6.70	6.35
4.....	13.25	12.87½	47.25	7.10	7.00	6.70	6.35

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Dec. 4.

Most of the markets are quiet but prices are steady to higher. Demand for copper is very light, but tin buying continues fairly active. The lead market is the strongest of all and demand for zinc has fallen off decidedly.

Copper.—The electrolytic copper market has turned decidedly dull the last week and there is an absence of both buying and inquiry. Under such circumstances prices have usually declined in the last few months, but this time quotations have remained steady at 13.12½c. to 13.25c., delivered, the whole week. Lake copper is largely nominal at 13.25c., delivered.

Copper Averages.—The average price of Lake copper for the month of November, based on daily quotations in THE IRON AGE, was 13.31c., New York. The average price of electrolytic copper was 12.76c., refinery, or 13.01c., delivered.

Tin.—The shortage of Straits tin for December which appeared possible a short time ago has been relieved by shipments from London. Already 300 tons has arrived and an equal amount is afloat. Yesterday some sellers became panicky in the absence of any sustained demand and one lot of December delivery sold as low as 46.75c. The week as a whole has been quiet compared with previous ones, total sales amounting to only 250 tons, of which 150 tons was sold on the Metal Exchange on Nov. 28. The quotation for spot Straits tin today at New York was 47.25c., with the market inactive. London prices today were about £5 per ton higher than a week ago, with spot Standard quoted at £236 15s., future standard at £237 12s. 6d. and spot Straits at £238 5s. Deliveries into consumption for the month of November were 6785 tons, with 1072 tons in stock and landing on Nov. 30. Imports for 11 months of this year have been 62,712 tons, of which 4180 tons was received in November. Arrivals thus far this month have been 675 tons, with 6095 tons reported afloat.

Lead.—The market is strong, demand is good and prices have advanced. The leading interest raised its quotation on Dec. 1 from 6.85c. to 7c., New York, the outside market having already reached that level several days before. Today as high as 7.10c., New York, was paid and yesterday the metal sold as high as 6.90c., St. Louis, which is equivalent to 7.25c., New York. It is apparent that sellers who previously had been trying to hold the market in check have parted with their metal and are no longer selling.

Zinc.—The market has turned extremely dull with almost no sales or inquiries. Prime Western for early delivery is quoted largely nominal at 6.35c., St. Louis, or 6.70c., New York. Prices here and in London are not conducive to export business.

Nickel.—Shot and ingot nickel are quoted unchanged at 29c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers. Both shot and ingot nickel in the outside market are quoted at 29c. to 32c.

Antimony.—The market is easier with wholesale lots of Chinese metal for early delivery quoted at 8.75c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 26 to 26.50c., delivered, duty paid, with some sellers unable to obtain the metal from foreign producers.

Old Metals.—Business is quiet and the market is generally unchanged. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.75
Copper, light and bottoms	10.00
Heavy machine composition	10.50
Brass, heavy	7.75
Brass, light	6.25
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	6.75
Lead, heavy	6.50
Lead, tea	5.50
Zinc	5.00
Cast aluminum	16.75
Sheet aluminum	16.75

Chicago

CHICAGO, Dec. 4.—Tin and lead have advanced while the other metals remain unchanged. Tin is closely held and advances with every indication of interest on the part of the buyers. Lead has gone up as a result of an advance for the leading interest. In fact, independents are quoting even higher than the price of the foremost producer. While copper prices are unchanged, there has been considerable buying for first quarter as well as a fair volume for second quarter. Spelter is also considered a good buy at present prices and some first quarter business is being placed. Although antimony is offered more freely, it is stiffer in price than a week ago. Old metal prices remain unchanged. We quote in carload lots: Lake copper, 13.50c.; tin, 48.50c.; lead, 7c.; spelter, 6.40c.; antimony, 11c.; in less than carload lots. On old metals we quote copper wire crucible shapes and copper clips 10.50c.; copper bottoms, 9.25c.; red brass, 8.50c.; yellow brass, 6.50c.; lead pipe, 5.50c.; zinc, 4.25c.; pewter, No. 1, 25c.; tin foil, 32c.; block tin, 36c.; all buying prices for less than carload lots.

Production Well Sustained in Mahoning Valley

YOUNGSTOWN, Dec. 4.—Iron and steel production is well sustained this week in the Mahoning Valley, losses in one direction being more than offset by gains in others. For instance, the steel ingot production rate of the Youngstown Sheet & Tube Co. this week is 75 per cent, as compared with a recent low of 45 per cent. The company this week added one active open-hearth furnace at its Brier Hill plant, for a total of 11 active furnaces in the group at Youngstown and East Youngstown.

Rolling mill operating average is also higher, inasmuch as Sheet & Tube company has placed five mills at its Western reserve plant, Warren, on the active list. The Mahoning Valley Steel Co. has added four mills to its active complements at Niles, for a total of eight, its complete group.

On the other hand, the Trumbull Steel Co. has suspended two sheet mills, and has reduced the operations of its strip department to a 60 per cent basis.

The Sheet & Tube company has suspended its Tod blast furnace, in the Brier Hill plant, cutting the number of its active stacks in the Youngstown district to four, of nine. The company has an ample supply of iron, however, in its furnace yard.

On the other hand, the A. M. Byers Co., Pittsburgh, is preparing to blow in its Mattie blast furnace at Girard, Ohio, which has been inactive for repairs, and it is expected the stack will resume this month.

Of the 120 sheet and jobbing mills in the Mahoning Valley, 74 were scheduled at the beginning of the week, a gain of seven as compared with the week before, while 15 of 17 pipe mills are in commission.

Production of bench workers has been increased 22 per cent merely by raising the height of the stools 2 in., according to William R. Basset, president of Miller, Franklin, Basset & Co., Inc., New York, in a discussion of the effect of fatigue. Unnecessary noise has been found to be very tiring, he said.

PERSONAL

Mark Fenton, vice-president New Industries Co., Youngstown, Ohio, who is cooperating with the Youngstown Chamber of Commerce in securing new industries for that city, is on tour in the South addressing civic bodies on the subject of community cooperation in securing industrial enterprises. He is scheduled to speak this week at Orlando and Jacksonville, Fla., and points in Alabama and Georgia.

L. J. Campbell, president and chairman of the board of directors Atlas Steel Corporation, Dunkirk, N. Y., soon will be brought to the home of his father, James A. Campbell, Youngstown, Ohio, from New York, where he has been recovering from the amputation of his left leg. Mr. Campbell's complete recovery is expected, as he is improving rapidly.

J. S. Vanick has resigned as research metallurgist for the government fixed nitrogen research laboratory and as liaison officer for sections of the War Department at the Bureau of Standards to accept a position as research metallurgist in the new research and development department of the International Nickel Co., Bayonne, N. J.

R. C. Moore, chief engineer Charles A. Schieren Co., New York, is scheduled to deliver an address on "Leather Belting—Its Manufacture, Uses and Abuses," at the meeting of the machine shop section of the Providence Engineering Society at the society's rooms, Providence, R. I., on the evening of Dec. 11.

G. Bluemel, previously connected with the Ferguson Furnace Co. for eight years as chief engineer and vice-president, has become associated with Tate-Jones & Co., Inc., furnace engineers and builders, and will manage the New York sales district covering New York, New Jersey and New England, with headquarters at 50 Church Street, New York.

L. J. Hammond has been elected president of the Strong, Carlisle & Hammond Co., Cleveland, to fill the vacancy caused by the recent death of Edgar A. Strong. Mr. Hammond has been treasurer of the company and general manager. He will continue in the latter capacity and has been succeeded as treasurer by H. W. Strong, formerly secretary. T. W. Carlisle has been elected secretary.

Jay J. Seaver has been elected vice-president of Arthur G. McKee & Co., engineers, Cleveland, succeeding Donald D. Herr, who was killed recently in the Japanese earthquake. Mr. Seaver, who is a graduate of the University of Michigan, has been associated with the McKee company for ten years and has a wide acquaintance among blast furnace men.

A. J. Theisen, secretary Great Lakes Foundry Co., Port Huron, Mich., sailed from New York Dec. 5 to spend several months in Europe and on the African Continent.

John H. Marlotte, at present with the Charles A. Strelinger Co., Detroit, and formerly secretary J. R. Stone Tool & Supply Co., Detroit, has joined the sales force of Stocker-Rumely-Wachs Co., Chicago, and will cover a territory consisting of the southern Chicago suburbs, northwestern Indiana and western Michigan.

W. J. Adamson, formerly assistant general sales manager Trumbull Steel Co., Warren, Ohio, has assumed the duties of assistant to the vice-president, and F. H. Loomis will take over his former position. A. C. Adams of the home district sales department will succeed Mr. Loomis as home district sales manager. R. G. Carter will have charge of the office management of the general sales department.

J. C. Mears of the St. Louis office of Rogers, Brown & Co., has been transferred to Chicago, where he will continue to cover the States of Iowa and Nebraska, which have been added to the territory served by the Chicago office. S. B. Morrison of the Philadelphia office has been transferred to St. Louis as manager.

Barton R. Shover, consulting engineer, Pittsburgh, has been invited by the American committee of the World Power Conference, to be held in London, June 30 to July 12, to present a paper on "Power in the Steel Industry." He is well qualified to prepare such a paper by reason of his extensive experience in the steel industry as electrical engineer during the construction of the Gary, Ind., plant of the Illinois Steel Co.; as general manager of the Tata Iron & Steel Co., Jamshedpur, India; as general superintendent of the Brier Hill Steel Co., Youngstown, Ohio, and as consulting engineer for the Dominion Iron & Steel Co., Sydney, N. S., and for several other steel companies.

F. S. Auty, managing editor of *Chatter*, the monthly publication of the Machinery Club of Chicago, has been appointed advertising manager of Drying Systems, Inc., 11 South Desplaines Street, Chicago, manufacturer of equipment for baking enamels and Japans and for the drying of paint and varnishes on manufactured metal products.

Charles Deere Wiman, great-grandson of John Deere, has been appointed general manager of the Union Malleable Iron Works plant of Deere & Co., at East Moline, Ill. E. A. Gullberg, who has been acting manager and superintendent since the resignation of J. L. Simmons, will continue as general superintendent.

OBITUARY

CHARLES N. JAMES, Cambridge, Mass., who recently died in his fiftieth year, was associated for some time with the Dodge Haley Co., Boston, dealer in iron and steel. During the last part of his life Mr. James was actively engaged in the manufacture of automobile wheels.

HENRY PEARSON, vice-president Wason Mfg. Co., Springfield, Mass., car manufacturer, died suddenly Nov. 27 in his office. He was president of the company from 1906 to 1910, prior to its acquisition by the J. G. Brill Co. He was born in Stockport, England, Sept. 14, 1852.

ROBERT E. GASKELL, aged 68, president William Gaskell & Son, bolt and nut manufacturers, Brooklyn, died on Nov. 30 at his home in Oceanside, near Rockville Centre, L. I. Mr. Gaskell was born in Manchester, England. His father was William Gaskell, who, in 1865, founded the manufacturing firm in Brooklyn.

SAMUEL JAMES BURRELL PRIOR, head of the firm of tin plate merchants of that name at 47 King William Street, London, England, who recently had retired from active business, died on Nov. 28, at the age of 77.

FRANCIS E. MYERS, president, F. E. Myers & Bro. Co., pump manufacturer, Ashland, Ohio, died Dec. 3, aged 74 years.

Canadian Scrap Market

TORONTO, ONT., Dec. 3.—Melters continue to show but passing interest in the iron and steel scrap market and as a result the demand for most materials is almost at a standstill. Some trading is reported between dealers, but in most cases the movement is light, and buying is only reported at prices below the market. Steel plants are taking in odd lots of heavy melting steel and turnings, but in nearly all instances the demand is for spot delivery and no interest is reported in old material for first quarter. Iron and steel scrap prices are as follows:

	Toronto	Montreal
	Gross Tons	
Steel turnings	$10.00	$7.00
Machine shop turnings	10.00	7.00
Wrought pipe	8.00	8.00
Rails	12.00	13.50
No. 1 wrought scrap	14.00	14.00
Heavy melting steel	12.00	10.00
Steel axles	15.00	18.00
Axles wrought iron	18.00	20.00
	Net Tons	
Standard car wheels	15.00	14.00
Malleable scrap	15.00	12.00
Stove plate	15.00	14.00
No. 1 machinery cast	18.00	18.00

FOUNDRY CONVENTION OF 1924

American Foundrymen's Association Returns to a Fall Meeting

At a meeting of the board of directors of the American Foundrymen's Association, held in New York Nov. 20, it was unanimously voted to hold the next convention of the association and exhibit of foundry equipment in the fall of 1924, preferably in the month of October.

From 1911 to 1920 the annual meetings of the association were held in September or October of each year. Due to business conditions in 1921, the meeting was postponed, being held at Rochester in June of 1922. The last one was at Cleveland in May, 1923. There has been a feeling on the part of many that fall dates are more desirable and a number of good reasons have been given in support of the change.

It is pointed out that men who attend the conventions get new ideas from the papers and discussions, from contact with other foundrymen whom they meet, or at the exhibits, which can be advantageously applied to their operations. Members of the many technical committees receive inspiration and incentive to accomplish certain results, but with the coming of warm weather and summer vacations the application of methods and ideas advanced at a spring meeting is put to one side and too often forgotten altogether.

In the fall, managers, superintendents and foremen return from the conventions ready to put into practice immediately the things they have learned that will help them to improve output both in quality and quantity. It is believed that the exhibitors will also welcome a return to fall conventions, as it will give them a better opportunity of following up inquiries secured during convention week.

In considering location, the board of directors felt that the Central West was the logical place, as the Milwaukee convention in 1918 was the only one held west of Cleveland since the Chicago convention in 1914. The selection of a city was left to a special committee appointed by the president. The cities from which invitations have been received and which were given favorable consideration are Chicago, Detroit, Indianapolis, Kansas City and Milwaukee. The facilities these cities have to offer in hotel accommodations, meeting rooms and exhibition buildings will be investigated and a decision reached, announcement of which will probably be made some time in January. Members who have a preference as to location are invited to present their reasons to the secretary, C. E. Hoyt, 140 South Dearborn Street, Chicago, for the consideration of the committee.

NATIONAL ENGINEERING MUSEUM

Committee Organized to Interest Engineers and Leaders in Industry

The movement to establish a national museum of engineering and industry has taken on a new turn. The so-called four founder engineering societies—those of civil, electrical, mechanical and mining engineers—having decided that they were not constituted as societies to assume the responsibilities attendant on carrying out the project, an organizing committee of 25 has come into being with the plan of interesting individual members of the societies and leaders in industry in the museum movement. Briefly the effort is to secure a central place, say in Washington in connection with the Smithsonian Institution, where model and records of engineering developments may be exhibited, if not merely preserved, before many of them get lost or destroyed. It is believed that such a collection will be of great value to the investigator and that it is fitting that so great an industrial nation as the United States should possess a museum fully as comprehensive and educational as similar collections abroad.

The organizing committee is as follows:

Robert S. Brookings, president Institute of Economics, Washington, and regent Smithsonian Institution.

Irving T. Bush, president Bush Terminal Co., New York.

Robert W. de Forest, president Metropolitan Museum of Art, New York.

Frederic A. Delano, acting chairman of the committee, regent Smithsonian Institution, Washington.

Philip T. Dodge, president International Paper Co., New York.

Gano Dunn, president J. G. White Co., New York.

T. Coleman du Pont, financier, New York.

Howard Elliott, president Northern Pacific Railroad, New York.

Michael Friedsam, president B. Altman Co., New York.

Edwin M. Herr, president Westinghouse Electric & Mfg. Co., Pittsburgh.

Ira N. Hollis, president Worcester Polytechnic School, Worcester, Mass.

Edward N. Hurley, president Hurley Mfg. Co., Chicago.

Samuel Insull, president Commonwealth Edison Co., Chicago.

D. S. Jacobus, engineer Babcock & Wilcox Co., New York.

Thomas W. Lamont, J. P. Morgan & Co., New York.

Henry G. Leach, editor *The Forum*, New York.

William Barclay Parsons, engineer, New York.

Chas. Piez, president Link Belt Co., Chicago.

H. F. J. Porter (acting secretary), consulting engineer, New York.

George D. Pratt, president Pratt Institute, Brooklyn, N. Y.

George E. Roberts, vice-president National City Bank (acting treasurer), New York.

Julius Rosenwald, Sears, Roebuck & Co., Chicago.

Mortimer L. Schiff, Kuhn, Loeb & Co., New York.

Frederick D. Underwood, president Erie Railroad, New York.

Samuel M. Vauclain, president Baldwin Locomotive Works, Philadelphia.

President Grace Looks for Fair Average Year in 1924

President Eugene G. Grace of the Bethlehem Steel Co., in an interview a few days ago, took a cheerful view of business conditions.

The tide has turned for the better in the iron and steel industry of the country, according to Mr. Grace, at least so far as the business of the company is concerned. The low point in buying, he said, occurred a few months ago, and the volume of business has been gradually increasing since.

"A great many signs," said Mr. Grace, "indicate that 1924 will be a repetition of 1923 and that business conditions in the two years will prove similar." He pointed out that during the current year steel buying was heaviest in the spring, and he expects that a large demand for steel products would again be witnessed next spring.

In regard to the expected demand for steel products from the railroads, Mr. Grace said:

"We face about the same railroad buying program for equipment and maintenance, particularly track materials and cars. The railroads have made good money in 1923 and seem assured of another good year. Next year is going to be one of the biggest rail years we have ever had."

"The automotive industry is anything but pessimistic," said Mr. Grace. "Motor car makers anticipate that their output in 1924 will be about the same as in 1923. Building construction has held up and indications are it will continue to hold up. The farmer has more money now than he has had in many years. His equipment is depleted and obsolete and he must buy soon. Canning and allied industries are scheduled for 100 per cent operations.

"Foreign demand is gradually increasing. Finally, public sentiment is generally better than it was a year or so ago.

"Altogether, while I do not look for a boom in 1924, I think it will be a fair average business year."

FIGHTING PITTSBURGH PLUS

City of Chicago Joins Other Opponents, Including Three New England States, Against the Practice

CHICAGO, Dec. 1.—In a meeting here this week, the City Council of this city passed a resolution condemning the Pittsburgh basing point method as applied to the sale of finished steel, and authorized the mayor to have the city represented through its law department before the Federal Trade Commission in the suit now pending so that the interests of the city might be conserved and protected. The resolution was adopted unanimously, following which the mayor directed Francis X. Busch, corporation counsel, to appoint Leon A. Hornstein, assistant corporation counsel, as the city's representative at the hearings before the Federal Trade Commission at Washington this month.

Another important recent development having a bearing on the Pittsburgh basing point case is the alignment of three New England States, *i. e.* Maine, Massachusetts and Rhode Island, with the organization known as the Associated States Opposing Pittsburgh Plus. The addition of these States to the membership of the association raises the number of constituent commonwealths to 31. More significant is the fact that the admission of these Eastern States robs the organization of its sectional character. Heretofore protests against the Pittsburgh basing point practice had been confined to Western and Southern States.

The resolutions adopted by the Chicago council charged that the Pittsburgh plus practice tended to centralize the steel industry in the city of Pittsburgh at the expense of the rest of the country, that it gravely injured labor in the city of Chicago by the prevention of that continuous employment which results in the establishment in a city of striving industry, and that in times of business depression the practice curtails the operations of Chicago steel mills to the end that Pittsburgh mills may compete in Chicago, thus depriving many laboring men of employment and injuring business in Chicago and its environs. The resolutions further went on to say that Chicago is not permitted to obtain the industrial benefits which should accrue to it because of natural advantages as a low cost producing point for steel.

Cautious Optimism in Business

"What's Ahead for American Business?" is the title of the pamphlet which has been issued by P. F. McDonald & Co., Boston, for free distribution. The writer gives the opinions of many business men of prominence in regard to business conditions showing an attitude of cautious optimism. In the Digest of Forecasts P. F. McDonald, president of the company, says:

We have been and still are passing through a period of adjustment, but this, it is universally conceded, is almost over and the fruits it will bear in the shape of increased efficiency of labor, sane purchasing and other normal principles will be well worth while and bespeaks a continued period of successful trading. Consequently we may look from now on and through the spring and summer of 1924 for a marked improvement in industry, spurred on by construction activity, railroad purchasing and a gradual rectification of European conditions.

Buyers Hesitate in Youngstown District

YOUNGSTOWN, Dec. 4.—Hesitancy as to the stability of current steel prices is still retarding buying, especially for forward commitments, in the opinion of James A. Campbell, president, Youngstown Sheet & Tube Co. He expects buying to materialize in a larger way, however, in the very near future, judging from the volume of inquiry before the trade.

Mr. Campbell believes buyers who are waiting for lower prices are likely to be disappointed, pointing out that for six months buyers of pig iron held down their actual purchases to hand-to-mouth requirements. When the iron buyers realized that the market could not be depressed to any greater degree, and saw that the stock of iron in furnace yards was fast dwindling, they came in for heavy tonnages.

The Sheet & Tube Co. has contracted for large tonnages of iron for next quarter delivery, involving in excess of 150,000 tons, from its furnaces in the Youngstown and Chicago districts.

In the semi-finished steel market, sheet bars are firmly held at $42.50, despite the efforts of non-integrated sheet rolling interests to dislodge this quotation. In billets and slabs, though, the situation is somewhat different, and the price situation is not so firm. Sheet rolling interests will soon begin signing contracts for first quarter requirements.

Makers of merchant bars in this district insist there is no shading of the 2.40c. current level, and that all forward business coming through is being booked at this figure.

Lake Superior Iron Ore Shipments by Water for the Year

CLEVELAND, Dec. 3.—Iron ore shipments by water from the Lake Superior district during 1923 were 59,036,704 gross tons. Shipments during November amounted to 4,938,249 tons. The movement for the season shows a gain of 16,423,475 tons or 38.52 per cent over 1922, when the movement was 42,613,229 tons. The 1923 movement was the largest since 1918, when water shipments amounted to 61,156,732 tons. The peak was reached with 64,734,198 tons in 1916, the 61,000,000-ton mark being passed in both the following years. In 1919 the movement dropped back to 47,177,395 tons, but it climbed to 58,527,226 tons in 1920, and in the lean year of 1921 it fell to 22,300,726 tons. It is estimated that the all rail shipments for the year will amount to from 1,500,000 to 2,000,000 tons.

The following table gives the season shipment by ports in gross ton and the corresponding figures for 1922.

	Season, 1923	Season, 1922
Escanaba	5,607,411	4,592,354
Marquette	2,789,285	1,976,220
Ashland	6,237,449	5,813,207
Superior	17,820,476	11,234,240
Duluth	20,163,619	13,044,771
Two Harbors	6,418,464	5,952,437
Total	59,036,704	42,613,229
1923 increase	16,423,475	

Cast-Iron Pipe Statistics for October

WASHINGTON, Dec. 1.—The Department of Commerce announces statistics on the production, shipments, orders and stock of cast-iron pipe for the month of October, 1923. The report includes returns from 12 establishments and is confined to bell and spigot pressure pipe exclusively. The principal items in tons are:

Produced during the month	88,696
Shipped during the month	88,000
Specified to be shipped from stock	17,431
Specified to be made	119,947
Not specified as to sizes	443

Reducing Hours in the South

BIRMINGHAM, ALA., Dec. 3.—The Tennessee Coal, Iron & Railroad Co. blast furnaces in the Birmingham district have eliminated the 12-hr. work day. Labor was shifted from plants of the steel corporation which have been lagging in activity lately. No complaint has been heard of as to the readjustment of hours or wages. It is expected other subsidiaries of the district will follow suit, though no announcements are made.

The United Engineering & Foundry Co., Pittsburgh, has definitely decided to abandon its Oak Street foundry, Youngstown, Ohio, and the property is being offered for sale. It has been idle for three years. The company will continue operation of its large Tod foundry in this city.

Czecho-Slovakia's Great Steel Works

(*Concluded from page* 1520)

plate three-high mill with a 1.8-m. two-high for riffeling sheets, one 800 to 650-mm. (31½-in. to 25½-in.) universal two-high mill, one 475 to 420-mm. (18-¾-in. to 16½-in.) universal three-high mill, two 875-mm. (35½-in.) reversing roller two-high mill, one 600-mm. (23⅝-in.) roughing three-high mill and, for the small shapes, four finishing mills of 452, 330 and 280-mm. (17¾-in., 13-in. and 11-in.) with three continuous roughing mills of the same diameters. In the cold rolling mill are installed 44 housings with from 260-mm. (10-in.) to 120-mm. (4¾-in.) rolls.

There are in all 17 rolling mills for hot rolling, all electrically driven. Seven of them are worked by reversing direct current motors at 1000 volts and the others by 3-phase current of 5000 volts and 50 cycles. There are two transformer stations in the new works. The first transforms and reduces the primary 3-phase current of 5000 volts, generated by the gas engines in the power plants, to continuous current of 1000 volts for the reversing mills by means of four Leonard-Ilgner sets, and the second transforms and reduces the same primary current to continuous current of 500 volts for cranes and 125 volts for lighting purposes.

Blooming Mill

The diameter of the rolls is 1000 mm. (39⅜ in.), the length of their body, 2700 mm. (106 in.) They can roll ingots weighing 4000 kg. (4 tons) each to a cross section of 170 mm. x 120 mm. (6¾ x 4¾ in.) and slabs to a width of 1000 mm. (39⅜ in.) Electric motors are used for manipulating the ingots and there is automatically shown on a dial the section under the rolls.

The blooming mill is operated directly by a continuous current motor, capable of a revolving moment of 205 meter-tons (662 ft. tons) under a maximum of 12,900 hp. Material worked out in the cogging mill is cut to desired length by two hydraulic ingot shears, placed side by side, whence the material is carried immediately over to the reverse train or transported for distribution to furnaces.

Armor Plate Mill

The armor plate mill has rolls with diameter of 1250 mm. (49 in.) and length of 4500 mm. (177 in.). Ingots can be rolled here up to 80 tons weight ordinarily and a maximum of 100 tons. These plates can be rolled to 4200 mm. (165 in.) width and to 20 m. (65 ft.) length.* The rolls which are hydraulically balanced and worked by electricity, can be adjusted to 0.1 mm. (0.004 in.) and the adjustments shown on a circular point dial. Special attention is given to permitting the roll to expand freely and equally and, in case of a roll breaking, precaution is taken that the roll housings cannot part.

The cam-rolls are forged, with a half-circle diameter of 1600 mm. (63 in.) and have straight spur teeth set on a half round. The spindles are of forged steel; the upper hydraulically balanced and joined to the upper cam-roll by means of a cross link coupling of cast steel. Between the motor cam and the wheel installation is a socket coupling worked hydraulically, which prevents any axle inclination that might occur from the breaking of the coupling and thus affect the working of the engine. The lever installation in front of the rolling track, with an 80-ton lift capacity, serves to put ingots on the roll plate. Behind the track is a turning apparatus consisting of four pistons, cone shaped at the head, each of which gives a separate turning point to the plate. Plates can be moved through 180 deg.

Plates as rolled, both steel and iron, are finished partly in shops located in one end of the rolling mill proper, and partly in the Witkowitz shops. For iron plate rolling the roll diameter of the mills is 1000 mm. (39⅜ in.) and the revolutions 0 to 170 per min. Pieces weighing 4000 kg. (4 tons) can be handled, and plates turned out to 3000 mm. (118 in.) in width and 15 m. (49 ft.) in length. For heating these ingots before rolling, there are two furnaces using gas.

Electric Power Station

Fourteen years ago the Witkowitz central electric station, working Witkowitz gas engines, was probably the most efficient plant of its kind on the Continent. Nowhere had I seen such excellent gas engine work, with the possible exception of Resicza. Witkowitz built gas engines only for its own use and then, as now, its gas engines were run by men familiar with every essential of their construction. These engines are on the Otto system built under Witkowitz modification. They were operating 98 per cent of the working time, in other words, were running practically continuously, and such slowing down as was necessary did not exceed 2 per cent of the entire period.

The new electric power station No. 4 is operating with waste-heat boilers, whereby the efficiency factor of the gas consumption has been increased from 23 to 28 or 29 per cent. In this late development the cooling water of the gas engines is also used for hot water heating purposes, and because of this the efficiency factor has been increased further to over 30 per cent.

The highest current generation here was obtained in one of the four power plants in 1916 and 1917, six 2000-kw. engines developing the equivalent of 83,663,000 kwhr. As 1916 was a leap year, with 366 days, the theoretical amount obtainable was 8784 hr. x 12,000 kw. or 105,408,000 kwhr. The actual amount obtained was thus 79.6 per cent of that possible. The effective running time of the six engines was 47,048 hr., so on this basis the theoretical work possible amounted to 47,048 hr. x 2000 kw., or 94,096,000 kwhr. The load factor is, therefore, 83,663,000 ÷ 94,096,000, or 88.8 per cent.

History

The Witkowitz Iron Works were established in 1829 in northeastern Moravia. Coal was discovered in Moravia as far back as 1770. In 1782 it is said that there was an output of 1200 tons, while in 1907 the output amounted to 7,548,620 tons. The production of coke just before the war was slightly under 2,000,000 tons per annum.

The originator of the works was Archduke Rudolph, then Archbishop of Olmutz, who was also at the time owner of the Friedland Iron Works in Moravia. The Witkowitz Works were the first in Austrian territory to erect a coke furnace and to adopt the puddling process. Upon the death of the Archduke in 1831 the property passed into the hands of the Prince Archbishop, Count Chotek, who in turn leased it to a syndicate. In 1843 the banking house of Rothschild, located in Vienna, purchased the property.

Steady Growth

From the early founding of the works there has been continuous progress, development and enlargement of plant. The construction of the Kaiser Ferdinand Railroad established a connection between the Vienna district and Prussian Silesia and the East, and resulted in a further development of production at Witkowitz, chiefly in railroad material. It also afforded increased outlet facilities for the products and, with wider outlet, came a quickening in the growth of the works. The introduction of the Bessemer process made the production of steel on a large scale feasible and, up to the beginning of the World War, the growth of the plant had been uninterrupted.

The advance of the Russian Army at one time threatened Witkowitz; in fact, Russian advance forces reached within twenty miles of the plant. The heavy demands of the war caused still further expansion and, now that the plant has passed into the domain of Czecho-Slovakia, the war-time development will remain intact. Because of its location, this plant is bound to take advantage of the present German situation and, as in former years, will be the natural source of supply for that great territory to the eastward, when that region again becomes normal.

Iron and Steel Exports and Imports Decline

Drop of 20,000 Tons in Exports Places the Figure Lower Than in Any Month Since February—Imports Show the Smallest Tonnage of the Year

TABLES shown on this page and the next two give particulars of the outward and inward movement of iron and steel products, including machinery, for the month of October and for the first ten months of the year. Last week at page 1487 we published a general résumé of the situation, but were forced by pressure on our space to omit the tables.

Exports, January, 1922, to October, 1923, Inclusive
(In Gross Tons)

	All Iron and Steel	Pig Iron	Semi-finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,333	438,462	1,468,026
Calendar year 1919.....	4,239,837	309,682	258,907
Fiscal year 1920.....	4,212,732	248,126	288,766
Calendar year 1920.....	4,961,851	217,958	216,873
Fiscal year 1921.....	4,168,619	129,541	82,549
Calendar year 1921.....	2,213,042	28,305	10,363
January, 1922.....	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
June	212,295	1,996	13,178
Fiscal year 1922.....	1,721,418	28,330	63,127
July	157,169	1,943	10,149
August	145,640	1,791	9,353
September	129,475	5,203	6,810
October	132,924	1,553	8,364
November	127,782	3,464	7,157
December	150,170	3,136	8,449
Calendar year 1922.....	1,986,297	30,922	107,201
January, 1923.....	123,190	2,482	10,563
February	133,902	2,786	7,733
March	163,920	2,881	11,416
April	177,471	1,844	11,247
May	203,389	1,848	12,824
June	171,183	2,960	9,652
Fiscal year 1923.....	1,815,329	31,891	113,377
July	168,558	2,966	6,480
August	161,426	3,117	9,684
September	172,499	2,148	8,366
October	152,511	3,294	10,989
Ten months	1,628,005	26,270	98,956

*Calendar years.

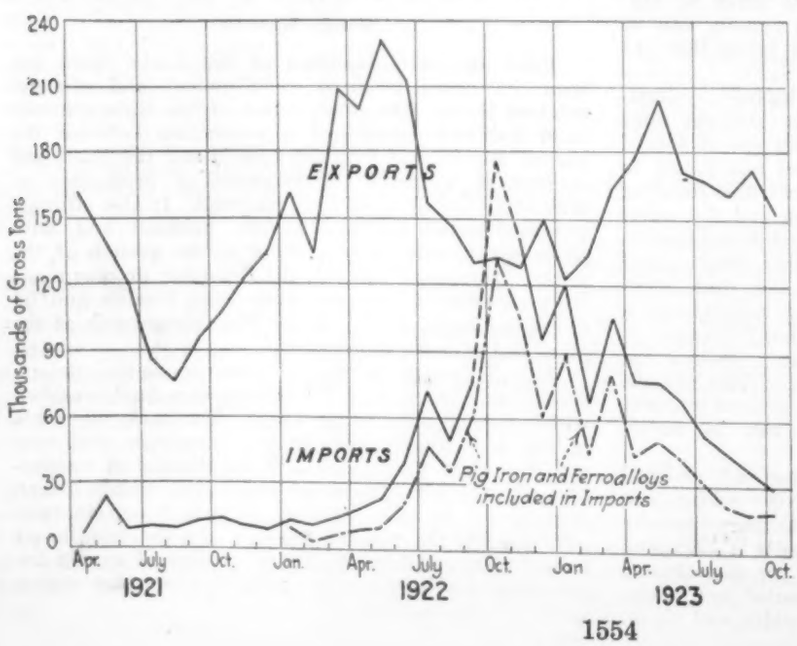
Exports to a total of 152,511 gross tons may be compared with 172,499 tons in September, with a monthly average of 151,361 tons in the fiscal year ended June 30 last, and with a monthly average of 165,525 tons for the calendar year 1922. Except for January and February, the October figure is the lowest yet in 1923. It is, however, higher than any of the five latest months of 1922 and represents a gain of about 20,000 tons over the corresponding month of last year. Despite the drop in tonnage from September, the value held up very well, the figures being $19,244,049 for October and $19,871,060 for September.

Imports of Iron and Steel in Gross Tons
(Monthly Average)

	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
1901 to 1913, incl.....	26,505	†14,132	....	....
1914 to 1918, incl.....	23,351	4,645	3,281	‡47,155
1919 to 1921, incl.....	23,901	5,708	3,710	37,115
1922	59,545	31,954	9,117	31,204
January, 1923.....	120,078	83,935	5,120	829
February	67,704	35,793	9,284	4,636
March	106,197	72,344	9,030	12,799
April	77,903	36,371	7,221	14,071
May	75,885	39,764	10,482	12,734
June	68,019	30,033	12,794	36,138
Six months average..	85,964	49,706	8,980	13,535
July	53,464	19,760	12,381	23,824
August	45,439	14,564	7,334	23,026
September	36,611	8,353	9,744	35,175
October	29,882	9,349	9,372	16,842

*Not included in "total imports."
†Includes ferroalloys.
‡Average for three years, 1916 to 1918 only.

Imports in October amounted to only 29,882 tons, compared with 36,611 tons in September, 45,439 tons in August, and more than 50,000 tons in each of the thirteen preceding months. As a matter of fact, the average for the first six months of the year amounted to 85,964 gross tons, this average being swollen by the heavy imports of pig iron last winter and spring. During the six months nearly 60 per cent of the total imports were accounted for by the pig iron figure, which showed an average of 49,706 tons per month, or nearly twice the total import figure for all iron and steel prod-



Monthly Tonnages of Exports and Imports for 31 Months, Showing How the Heavy Pig Iron Imports of a Year Ago Pushed the Total Imports to a Figure Higher Than for Exports—for the First Time Since the Heavy Inward Movement of Twenty Years Ago. The course of imports of pig iron and ferroalloys, considered as one group, is shown for comparison. For one year this one item was greater than the entire imports either before or since

Machinery Exports

By Value

	October, 1922	October, 1923	Ten Months Ended October, 1922	Ten Months Ended October, 1923
Locomotives	$355,777	$265,120	$7,873,556	$3,536,235
Other Steam Engines	90,554	137,755	1,854,426	1,026,589
Boilers	220,162	145,678	1,067,001	1,128,445
Accessories and Parts	290,816	433,551	2,531,076	3,213,360
Automobile Engines	346,163	541,533	4,561,640	4,776,156
Other Internal Combustion Engines	374,539	.....	3,562,202	.....
Stationary	.....	274,182	.....	3,690,097
Marine	.....	179,141	.....	1,476,836
Aircraft	.....	7,860	.....	41,617
Other Internal Combustion Engines	.....	107,036	.....	570,396
Accessories and Parts for	265,290	288,567	2,291,421	2,893,650
Electric Locomotives	29,779	18,126	377,395	3,010,865
Other Electric Machinery and Apparatus	425,753	894,081	6,734,249	7,157,182
Excavating Machinery	77,511	207,409	1,160,544	1,252,991
Concrete Mixers	27,485	54,728	479,746	456,412
Road Making Machinery	12,642	76,383	298,435	770,858
Elevators and Elevator Machinery	257,625	349,232	2,105,942	2,804,205
Mining and Quarrying Machinery	647,678	938,863	8,853,318	5,908,893
Oil Well Machinery	363,396	661,902	3,591,411	5,467,756
Pumps	503,660	690,654	4,944,770	6,140,528
Lathes	57,161	221,105	628,933	860,522
Boring and Drilling Machines	34,262	102,054	470,988	590,076
Planers, Shapers and Slotters	38,256	19,954	247,795	213,346
Bending and Power Presses	7,179	35,885	280,966	295,926
Gear Cutters	983	10,608	92,818	138,704
Milling Machines	69,389	73,198	312,924	385,138
Thread Cutting and Screw Machines	7,464	46,890	147,509	449,046
Punching and Shearing Machines	14,977	29,021	134,655	161,668
Power Hammers	10,386	8,491	106,485	131,813
Rolling Machines	786	.....	159,802	18,849
Sharpening and Grinding Machines	78,044	69,300	653,847	840,598
Other Metal Working Machinery and Parts of	370,408	408,325	4,603,611	3,929,974
Textile Machinery	579,217	726,787	12,146,945	7,724,775
Sewing Machines	868,502	916,410	5,592,616	7,408,679
Shoe Machinery	82,593	86,780	833,475	1,138,375
Flour-Mill and Gristmill Machinery	47,385	20,716	917,942	184,203
Sugar-mill Machinery	625,033	1,463,237	3,064,780	4,722,731
Paper and Pulp Mill Machinery	129,040	91,118	1,520,096	1,775,923
Sawmill Machinery	43,120	36,849	514,812	544,623
Other Woodworking Machinery	100,663	359,171	1,137,414	907,460
Refrigerating and Ice Making Machinery	112,211	204,271	1,519,032	1,916,357
Air Compressors	178,304	242,172	1,771,543	2,087,245
Typewriters	882,160	1,049,047	9,405,584	11,259,927
Power Laundry Machinery	51,255	77,332	562,413	823,071
Typesetting Machines	423,720	276,243	3,188,015	3,070,310
Printing Presses	365,227	430,383	2,992,754	3,735,258
Agricultural Machinery and Implements	1,650,776	3,224,780	19,398,206	43,165,968
All Other Machinery and Parts	8,085,527	8,382,747	71,551,486	135,791,349
Total	$19,189,666	$24,893,616	$195,934,578	$239,594,985

United States Exports of Iron and Steel

(In Gross Tons)

	October 1922	October 1923	Ten Months Ended October 1922	Ten Months Ended October 1923
Pig iron	1,553	3,294	24,320	26,370
Ferromanganese	5	1,019	1,059	4,284
Ferrosilicon	78	76	444	635
Scrap	4,510	5,186	59,813	54,400
Ingots, blooms, billets, sheet bar, skelp	8,364	10,989	91,595	98,956
Bar iron*	.....	511	.....	11,825
Steel bars*	9,659	12,224	148,416	134,950
Alloy steel bars	292	96	3,698	2,033
Wire rods	1,180	2,453	37,696	26,372
Plates, iron and steel	4,303	10,022	81,286	102,624
Sheets, galvanized	7,520	8,030	96,219	99,581
Sheets, black steel	6,256	7,858	204,144	85,273
Sheets, black iron	452	1,384	9,971	12,737
Hoops, bands, strip steel	2,969	3,493	27,928	33,350
Tin plate, terne plate, etc.	6,324	11,785	66,226	92,209
Structural shapes, plain material	11,151	5,871	107,847	106,885
Structural material, fabricated	3,596	6,264	38,731	66,073
Steel rails	20,202	21,122	240,674	218,944
Rail fastenings, switches, frogs, etc.	3,747	3,044	30,730	33,056
Boiler tubes, welded pipe and fittings	15,000	14,604	148,526	157,889
Cast iron pipe and fittings	2,629	2,797	22,117	23,677
Plain wire	8,894	6,052	100,306	76,234
Barbed wire and woven wire fencing	6,711	4,055	63,222	62,252
Wire cloth and screening	128	146	1,273	1,727
Wire rope and cable	512	364	3,959	5,432
Wire nails	2,131	3,370	48,967	32,548
All other nails and tacks	531	806	7,173	7,554
Horseshoes	72	71	803	773
Bolts, nuts, rivets and washers, except track	1,883	1,825	15,158	16,059
Car wheels and axles	1,238	2,235	13,868	17,647
Iron castings	706	993	8,247	8,646
Steel castings	193	304	1,906	4,183
Forgings	114	168	1,840	2,622
Machine screws	16	....	161	....
Total	132,924	152,511	1,708,323	1,628,005

*Not reported separately, prior to Sept. 22, 1922.

Sources of American Imports of Iron Ore

(In Gross Tons)

	Oct., 1922	Oct., 1923	Ten Months Ended Oct., 1922	Ten Months Ended Oct., 1923
Spain	.....	23,790	39,936	214,890
Sweden	40,229	30,243	260,037	704,867
Canada	601	566	2,355	24,525
Cuba	44,000	45,203	276,489	647,379
Other countries	38,577	*136,640	228,977	941,925
Total	123,407	236,442	807,794	2,533,586

*Includes Chile, 98,100 tons; Algeria and Tunis, 26,850 tons; Newfoundland and Labrador, 8,500 tons; Germany, 3,190 tons.

Machine Tool Exports

	October, 1923 Quantity	October, 1923 Value	September, 1923 Quantity	September, 1923 Value
Lathes	114	$321,105	62	$102,321
Boring and drilling machines	79	102,054	73	54,292
Planers, shapers and slotters	10	19,954	25	30,057
Bending and power presses	13	35,885	34	66,664
Gear cutters	7	10,608	68	11,144
Milling machines	54	73,198	17	23,065
Thread-cutting and screw machines	56	46,890	40	19,490
Punching and shearing machines	26	29,021	17	5,605
Power hammers	17	8,491	16	18,321
Rolling machines	....	.....	....	.....
Sharpening and grinding machines	189	69,300	469	114,779
Chucks, centering, lathe, drill and other metal-working tools	3,275	29,187	2,209	22,700
Pneumatic portable tools	573	38,084	714	44,923
Total	4,413	$783,777	3,744	$513,461

Imports of Machinery

(By Value)

	October, 1922	October, 1923	Ten Months Ended October, 1922	Ten Months Ended October, 1923
Metal-working machine tools	$18,674	$39,406	$185,539	$332,926
Agricultural machinery and implements	146,127	15,206	2,273,679	643,541
Electrical machinery and apparatus	108,807	261,910	599,267	1,472,617
Other power generating machinery*	137,431	99,629	†137,431	1,755,817
Other machinery	134,126	289,351	2,239,925	2,197,851
Vehicles except Agricultural	182,700	317,051	1,215,532	2,440,043
Total	$727,265	$1,022,553	$6,651,373	$8,842,795

*Not reported separately previous to Sept. 22, 1922.
†Sept. 22 to Oct. 31.

Exports by Countries of Destination

(In Gross Tons)

Plates	Oct., 1923	Ten Months Ended Oct., 1923
Canada	5,497	83,578
South America	30	1,073
Japan	125	817
Cuba	78	859
Philippine Islands	2	570
Mexico	41	562
Galvanized Sheets		
Canada	1,364	28,297
Cuba	1,331	11,707
Chile	11	2,698
Argentina	63	4,326
Philippine Islands	771	6,234
Central America	318	3,412
Japan	1,062	4,304
Mexico	752	5,444
Colombia	267	3,993
Black Steel Sheets		
Japan	4,165	27,633
Canada	2,773	45,025
Argentina	18	1,907
Cuba	202	1,655
Philippine Islands	...	176

Tin Plate	Oct., 1923	Ten Months Ended Oct., 1923
Canada	3,236	25,244
Japan	4,115	24,450
Argentina	347	5,071
Uruguay	37	3,033
China	1,400	7,995
British India	754	4,181
Chile	41	1,600
Cuba	476	4,033
Mexico	135	1,653
Hong Kong	...	2,071
Italy	...	2,266
Barbed Wire		
Cuba	438	8,314
Argentina	341	7,142
Australia	350	2,228
Mexico	346	3,385
British South Africa	259	5,029
Colombia	280	3,715
Brazil	1,003	8,114
Canada	20	4,542
West Indies	...	6,153

Steel Rails	Oct., 1923	Ten Months Ended Oct., 1923
Canada	4,418	48,384
Japan	10,314	68,937
Cuba	3,189	42,537
Chile	...	5,248
Brazil	570	3,716
Philippine Islands	141	3,750
Chosen	...	2,401
Honduras	655	8,245
Kwang Tung	...	11,143
Argentina	...	834
Mexico	227	3,024
Colombia	27	2,163
Galvanized Wire		
Japan	1,637	18,246
Argentina	158	11,270
Canada	1,234	12,840
Australia	924	6,282
Brazil	326	7,001
Mexico	639	3,528
Cuba	150	2,187
United Kingdom	223	1,927
Chile	54	4,053

Imports of Iron and Steel into the United States
(In Gross Tons)

	**Sept. 22 to Oct. 31, 1922	October 1923	Ten Months Ended October 1922	Ten Months Ended October 1923
Pig iron	120,779	9,349	229,950	346,166
Ferromanganese	11,229	8,802	83,240	82,452
Ferrosilicon	565	570	13,339	10,469
Scrap	28,677	3,046	88,792	154,416
Steel ingots, blooms, billets, slabs and steel bars	7,736	2,477	23,952	17,425
Rails and splice bars	2,394	2,881	24,260	25,403
Structural shapes	1,434	654	3,321	8,522
Boiler and other plates*	674	89	674	1,663
Sheets and saw plates	90	287	90	2,235
Bar iron	526	348	4,806	7,131
Tubular products*	306	407	306	3,695
Castings and forgings*	159	131	159	2,307
Nails and screws*	109	81	109	1,005
Tinplate	42	47	2,302	9,738
Bolts, nuts, rivets and washers*	31	22	31	177
Wire rods	27	295	1,328	3,317
Round iron and steel wire*	282	219	282	3,226
Flat wire and strip steel*	19	149	19	1,011
Wire rope and insulated wire, all kinds*	7	28	7	868
Total	175,086	29,882	476,967	681,226
Manganese ore	18,452	16,842	346,179	179,255
Iron ore	123,407	236,442	807,594	2,533,586
Magnesite	17,816	371	108,006	62,499

*Not reported separately previous to Sept. 22, 1922.
**Present tariff law became effective Sept. 22, 1922.

ucts in October. Again, despite the falling off in tonnage, the value remained up, for October imports at $1,825,093 recorded an increase over the September value of $1,785,166.

Exports of machinery showed a slight falling off from September, being $24,893,616 against $25,555,407. The figure for October, 1922, was $19,189,666. Included in the October figure were machine tools numbering 4413, valued at $783,777 compared with 3744 machines in September, valued at $513,461. Imports of machinery in October nearly doubled the September figure, being $1,022,553 against $518,860.

In the diagram will be found the record of imports and exports month by month from April, 1921, through the first ten months of 1923.

Compared with September, October showed marked reductions in exports of rails and both plain and fabricated structural materials, plain wire, wire rods and boiler tubes, welded pipe and fittings. There was a substantial increase in shipments of semi-finished steel, of plates and of tin plate.

Industrial Activity Maintained at Bridgeport

The Manufacturers' Association, Bridgeport, Conn., issues once a month a report of industrial activity in Bridgeport based on reports of 31 leading manufacturing plants. The Dec. 1 report, which covers conditions up to Nov. 24, shows there has been no serious let-down in activity as compared with earlier periods of 1923. In the week ended Nov. 24, there was a total of 15,771 employees at work in the 31 plants, the highest number employed during the year having been 18,399 in the week of April 7. The number of man hours for the week ended Nov. 24 was 735,435, the highest having been 930,741, also in the week of April 7.

Schools are being developed at the Rouge plant of the Ford Motor Co. along the same lines as those already in operation at the Highland Park plant. More than 300 have enrolled in the toolroom apprentice course which includes mathematics, mechanical drawing and shop practice. The Ford service school at Highland Park continues to attract pupils from all over the world. Among those who have enrolled recently are a group of 41 young men from India who have organized themselves as the Hindoostan Auto Club of America.

TRAINING FOUNDRY WORKERS

Quad City Foundrymen Association Considers Industrial Education

The Quad City Foundrymen's Association held a meeting at the Le Claire Hotel, Moline, Ill., Nov. 26, devoted to the training of foundry workers, the principal address being delivered by H. A. Frommelt, supervisor of training for the Falk Corporation, Milwaukee, Wis. Mr. Frommelt delivered a similar address before the National Founders' Association at its recent convention in New York and his talk was abstracted in THE IRON AGE of Nov. 29, p. 1490.

John Casto, superintendent Township High School, East Moline, responded for the public school, reviewing the work done by the public schools, and called attention to the fact that within the past six months the school authorities in East Moline called a meeting to which they invited representatives from the East Moline factories. At this time a program was mapped out for a more extensive program in industrial education. This program has now advanced to the point where they have installed over $3,000 worth of machinery and they intend to increase their activities just as fast as conditions warrant.

Mr. Casto pointed out that up until recently many of the educators were not interested in taking on industrial work, but during the last few years many have given this matter serious consideration and realize the importance of having the public schools cooperate with the industries in the continuation of the education of the boys who leave school for the industries.

The subject of vocational education in public schools was also discussed by J. F. Kolb, state supervisor of vocational education for Illinois. Mr. Kolb outlined the different methods of vocational education in the schools which were being sponsored by the State and which would upon adoption by any community receive a special financial aid for their operation from the State. Mr. Kolb cited several instances of the successful operation of these schools in Chicago, Joliet, Cicero and other industrial communities within the State.

Report of Ontario's Iron Ore Committee

TORONTO, ONT., Dec. 3.—The report of the Ontario Iron Ore Committee, of which Lloyd Harris was chairman, which was appointed by the late Government, is in the hands of Hon. Charles McCrea, Minister of Mines. The report finds that the magnetic iron ore deposits running 50 per cent and upwards in iron, though high in sulphur, can be commercially sintered and treated to produce a product suitable for the blast furnace; that some deposits of banded and other low grade magnetites favorably situated with respect to markets, lend themselves to commercial exploitation; that some siderite ores can be commercially sintered to produce a first class product; that positive evidence of the feasibility of treatment will probably be available this year in regard to magnetic concentration; that a market can be found in Ontario annually for approximately 750,000 tons of sintered ore; that the pig iron capacity of Ontario furnaces is sufficient to supply all the requirements of the province, and that concentration of other beneficiation is essential for the Ontario deposits. The committee points out that although there have been no important discoveries of iron ore of such class as to render it commercial without beneficiation, it must not be assumed that chances of finding such ore are by any means eliminated.

The Georgia Division of the Southern Metal Trades Association held a meeting at Columbus, Ga., Nov. 13, at which the principal subject of discussion was "Cost Keeping." Addresses were made by John G. S. Schofield, Thos. Perkins and others. Resolutions were adopted opposing the granting of a bonus to any able-bodied soldier of the late war. The delegates were tendered a luncheon by Golden's Foundry & Machine Co., after which the plant was visited.

Rigid Rules for Trade Associations

Decree of United States Court in Case of Tile Manufacturers Prohibits Many Activities

WASHINGTON, Dec. 4.—Looked upon by many who are interested in the subject as the charter of the Department of Justice for trade associations, the recent final consent decree of the United States District Court for Southern Ohio at Columbus, ordering the dissolution of the Tile Manufacturers' Credit Association, et al., has created distinct disappointment. It is held to be so restricted in its permissive features for trade association work that apprehension is felt that it will discourage such activity and that it may bring about greatly curtailed work of those associations now existing if it will not cause many to dissolve for fear of legal action by the department. Interest also is manifested as to whether or not it will reduce greatly cooperation between trade associations and Government bureaus, a matter which has given considerable impetus through the endeavors of such Government officials as Secretary of Commerce Hoover. It is the conviction of those who have read the decree that its rulings are so rigid as to deprive trade association of a vast amount of work that not only is harmless in a legal sense, but is of great value both for the industries they represent and in aiding Government departments to compile information. The decree incidentally would permit continued cooperation with the Government in handling certain kinds of information, but would not permit its distribution among the trades interested. While it permits information to be disseminated as to freight rates, even here it is provided that such rates "shall be the actual rates between points of shipment and delivery, and shall not be based on any fixed or basing point." This part of the decree is taken by some to be aimed at the practice used in the iron and steel and other industries in quoting prices at fixed production points.

Another example of the restricted character of the decree is that among the permissive activities it sanctions no reference is made to the collection of trade statistics. The law department of the National Association of Manufacturers urged upon the Department of Justice to include among the permissive activities in the tile case the collection of facts relating to capital employed, power used, wages and taxes paid, fuel consumed, machinery employed, production, sales, shipments and stocks on hand and prices obtained. But compiling even such fundamental information as this was not assented to by the department. The charge against the Tile Manufacturers' Credit Association, brought under the Sherman anti-trust law, was that it had been organized primarily to establish and maintain uniform prices.

Permissive Clauses

The permissive clauses of the decree include research; publicity; dealing with engineering and trade problems to advance manufacture; securing of arbitration of trade disputes; carrying on educational work pertinent to the industry through fellowships in schools and colleges and experimental and research work; instruction of mechanics and training of apprentices; maintaining a traffic bureau to present traffic questions before Federal and State commissions and to supply rate information to members, "but all rates furnished shall be the actual rates between points of shipment and delivery and shall not be based on any fixed or basing point"; improving sanitation, etc.; handling insurance; maintaining a credit bureau for the sole purpose of furnishing upon specific requests information as to the financial standing and the credit rating of those purchasing or attempting to purchase tiles; maintaining standardization of quality and of technical and scientific terms and the elimination of nonessential types, sizes, etc.

The decree also permits the giving of information to any Governmental agency as to production, shipments, stocks on hand and the prices of tiles, but restrains distribution of such information among members of the association, "except that information respecting sales may be collected annually and used to enable the assessment of the several expenses of the association, and for no other purpose." The decree provides that nothing in its provisions shall prohibit any defendant from doing any of the acts mentioned if done individually.

Acts Prohibited

The long list of acts prohibited as an association include the following:

Adoption or use of a uniform basic price list, or fixing and adopting list prices; maintaining uniform prices; establishing or maintaining individual prices that are uniform for all classes of purchasers or dealers and for all sales; establishing or maintaining of rules as to acceptance of orders at prices in effect prior to changes; establishing or maintaining uniform limitations on the proportionate amounts of the lower grades of tile sold; selling tiles f.o.b. factory with freight equalized with other factories making the same class of tiles; compiling and distributing freight rate books for use in making freight equalizations; establishing or maintaining uniform terms of sales or uniform conditions for acceptance of orders; refusing to combine less than carload shipments into carload shipments invoiced to one of the purchasers; refusing to sell to any persons or corporations because of any unpaid accounts; imposing limitations upon credit granted; restricting sales to dealers or contractors in tile or to establish uniform requirements for classification as dealers or contractors; establishing any system of cooperative purchasing of raw materials or supplies or of cooperative owning of sources of raw materials which shall eliminate or tend to eliminate competition in the purchase of materials; preparing and publishing any list or lists of dealers or of certified dealers; advising or communicating with one another as to proposed advances or decreases in prices or circulating among themselves in any way information relating to proposed advances or decreases in prices, or to prices charged or to be charged; discriminating in favor of or against any individual or corporation purchasing or attempting to purchase tiles.

C. S. Davis & Co., Chicago, dealers in tin plate, sheet steel and terne plate, have purchased 6478 sq. ft. of land adjoining the company's property at Iron and West Thirty-seventh Streets. The present building is to be raised to permit the operation of overhead cranes and a new building will be erected. The improved plant will contain approximately 21,500 sq. ft. of floor space, 18,000 of which will be on the first floor. Three five-ton cranes will serve the bays of the warehouse and unloading will be done by crane-trucks of 3000-lb. capacity. The entire plant will be built on a car-floor level, with a heavy reinforced concrete floor. The company is establishing a new department to handle sheet steel of all grades, roofing terne plate, long terne sheets, charcoal bright tin plate and black plate.

Statistics on the smelting and refining of non-ferrous metals for the year 1921 have been compiled by the Bureau of the Census. The pamphlet is obtainable from the Government Printing Office, Washington, at 5 cents a copy.

IRON FOUNDRY IMPROVEMENTS*

Twin Cupolas—Rough Cleaning Large Castings—Charging Room Floor Space

While many of the modern gray iron foundries are replete with both overhead and floor labor saving devices; are well designed for day and artificial illumination; well ventilated and sanitary, with splendid melting apparatus, the one feature in the case of many is lack of sufficient charging room floor space.

Charging Room Floor Space

This I believe has been taken care of better in the case of the large foundries in New England than elsewhere as far as my observation goes. I am speaking of this matter because it has appeared to me that this important part of the foundry has received less attention than any other. In one of the best that I have seen, the charging room is comfortable and clean; very well ventilated and so large that a month's supply of coke can be and is stored at one end.

It will interest you to learn how the coke proposition at this plant is handled. A railroad siding runs parallel with the rear wall of the charging room. A pit of appropriate dimensions has been built under the tracks, and from the bottom of this pit to a hopper on the roof of the charging room runs a skip hoist. As the coke arrives in the yard, a car is placed over the pit and the coke discharging from the car bottom is allowed to drop in the skip. The skip is raised and the coke dumped automatically into a hopper, from the bottom of which are tubes that run through the roof into the charging room. On trolley rails, running from the coke pile in the charging room to the cupolas, hangs a coke bucket, the bail of which is connected with a trolley carriage that rests on that part of the trolley rails to which an overhead suspended scale is connected during the loading of the bucket. The operator forks the coke into the bucket until the proper weight is obtained, pushes the bucket over to the charging door, releases the trip and dumps the coke into the cupola.

Twin Cupolas

It might interest you to know that at this foundry twin cupolas are used. These cupolas are 4½ ft. apart and built integral; with and between them is a rectangular hearth, its bottom being level with that of the cupolas. This assemblage is called a melting unit, of which there are two. Both cupolas in the unit are run at the same time, and under the conditions stated, the molten metal is obviously at the same level in the entire system. Through this design a very clean and hot iron is obtained, lower in sulphur than obtainable if the hourly capacity of metal was melted in one cupola, for reasons that immediately will occur to you.

The cupolas have two charging doors opposite each other, one for the coke and the other for the pig iron. The pig iron is not raised to the charging room floor by an elevator, but is placed in a side dumping car attached to a cable and is discharged directly into the cupola upon its arrival opposite the charging door, the door sill being protected by an inclined wearing and guiding plate. There are numerous advantages to the use of the incline over the elevator. The mixtures for the day are put up under cover and in the vicinity of where the incline starts. In this manner the pig iron screw and scrap can be placed on the charging cars and run up to the charging floor with less labor and more convenience than is possible where an elevator is used and where the mixture is spread all over the charging room floor.

Rough Cleaning Large Castings

At another foundry one of the things that appealed to me was the manner in which they had rigged up to rough clean their large castings as they came from the foundry floors. For this purpose a space about 20 x 20 ft. is inclosed by a galvanized covered wooden fence about 8 ft. high. On one of the sides are doors of such size as to permit the introduction of the casting that is to be cleaned. Protruding through appropriate openings on one side are two hose nozzles about 3 ft. apart, the nozzles being mounted on flexible connections that admit of their being pointed in any direction. Above the nozzles are small windows that enable the operator to see what he is doing from his position outside of the inclosure. Both on the inside and outside of the flexible joint a piece of loose canvas is tied around the nozzle and the edges tacked to the fence, to the end that water cannot spray on the operator. A stream of water at about 200 lb. pressure is played on the castings which are cleaned at a very low labor cost and with a prevention of the dust nuisance that invariably is an accompaniment of all other methods.

Cupola Blast Pressure and Tuyeres

Concerning cupola practice likewise I will be brief. Any blast pressure in excess of that required to penetrate to the center of the coke bed is detrimental, for it does not facilitate combustion; it can actually interfere with the attainment of the highest temperature desired, while it is hard on the linings. What is desired is only that amount of air in pounds that will burn the number of pounds of carbon in the coke used. Theoretically, one pound of carbon requires that amount of oxygen that is contained in 11.5 lb. of air, which will be equivalent to about 152 cu. ft. of air at 70 deg. Fahr. As coke contains ash and consequently does not consist wholly of carbon, a safe average for coke would be about 137 cu. ft. per lb. of coke.

Both the Whiting and Colliau cupolas have an upper and lower set of continuous tuyeres and the tuyere area has been figured correctly for the diameter used, but the height is not always adjusted for the foundry conditions to be met. The placing of the tuyeres higher than this requirement has no advantage as there is no combustion below the tuyeres, nor has this an influence in keeping the metal hot, while it invites excess sulphur absorption. I would also point out that those who have plugged their upper tuyeres have done so in ignorance of the principle involved. The ratio of distance from bottom of charging door to bottom of hearth to inside diameter, should in the larger cupolas be 3.5 to 1, or 4 to 1 in the smaller sizes.

Parallel lining gives best results. If a taper is used it should be one with no abrupt change from the larger to the smaller diameter, otherwise irregularity in the settling of the charge and the rearrangement occasioned means loss of heat and non-uniformity in composition; or, the following serious condition may result:

You have all heard of what is called foaming slag. This condition is usually attributed to the use of light coke or bad coke. Such a happening may have arisen at times from this source, but this has not been my experience. I have always traced this trouble either to an abrupt change in stack to hearth diameter, to failure to keep the region around the melting zone in proper repair, or to the charging of the stock in such a manner that one side of the charge is higher than the other and consequently settles unevenly. No cupola is correctly charged in which anything but coke can at any time come directly in front of or too near the tuyeres, and this can very easily obtain if the foregoing principles are violated. If the charging is such that iron instead of coke comes in front of the tuyeres, then the air blast will oxidize the iron with extreme rapidity which, being a base, will immediately attack the acid lining of the cupola to form a slag consisting of silicate of iron. This being formed directly in front of the tuyeres will get filled with air like a sponge, will clog the tuyeres and possibly foam out through the charging door if the case is a bad one.

*From an address by Enrique Touceda, consulting metallurgist American Malleable Castings Association, Albany, N. Y., delivered before the National Founders' Association in New York, Nov. 21.

Rud. K. Boggs, purchasing agent of the Andrews Steel Co. and Newport Rolling Mill Co., Newport, Ky., addressed the high school night classes on salesmanship, Nov. 19, at the Woodward High School, Cincinnati, on "The Purchasing Agent's Viewpoint of a Salesman."

Machinery Markets and News of the Works

FORD AGAIN A LARGE BUYER

Detroit Automobile Plant Purchases 17 Lathes and 8 Shapers

Eaton Axle & Spring Co. Also a Buyer—Business Generally Is Quiet, Though Many Inquiries Are Pending

The largest machine-tool buying of the past week is reported from Detroit, where the Ford Motor Co. placed orders for 17 engine lathes and 8 shapers. Ford is also reported to have ordered 75 special machines recently from a Cincinnati tool builder. The Eaton Axle & Spring Co., Cleveland, bought 9 motor-driven grinding machines.

Except for these orders, business in all sections is at low ebb, though many inquiries are pending, most of them probably in anticipation of 1924 requirements. If half of the business that is pending were to be closed this month, the machine-tool trade would end the year very satisfactorily, but buyers appear to be in no hurry to close and a majority of the inquiries will probably go over until after Jan. 1.

In the railroad field there is little activity, but it is expected that the pending orders of the New York Central for some 40 or 50 tools may be placed this month. The Norfolk & Western is reported to have placed orders for a number of tools, a hangover from its recent list. A number of railroad lists are in course of preparation and may be issued shortly after the first of the year.

November turned out to be a better month than was expected, sales with some companies having exceeded those of October, but conditions are spotty and not a few machine-tool companies have taken very little business.

The Board of Education of Chicago has issued an inquiry for 10 geared-head engine lathes, a shaper and a universal milling machine and some miscellaneous foundry equipment for the Tilden High School.

New York

NEW YORK, Dec. 4.

IF machine-tool sellers could close half of the inquiries that are pending they would finish the year with a very satisfactory volume of business. But prospective buyers are in no haste to close, and the assumption is that most of the pending inquiries are looking ahead to next year's requirements rather than for immediate needs. No large business is in sight except the lists of the New York Central Railroad, on which action is expected this month. The New Departure Mfg. Co., Bristol, Conn., which has recently bought some equipment, is also expected to be a buyer again this month or next, but its original requirements are said to have been materially cut down. Two orders have come to Eastern machine tool builders from Chicago, one for a 48-in. car wheel borer from the Chicago, Burlington & Quincy Railroad and the other for an 800-lb. steam hammer from the Illinois Steel Co.

Contract has been awarded by the Multi-Metal Co., 251 West Nineteenth Street, New York, to William Rossi, 805 East Tremont Avenue, for a one-story plant, 75 x 100 ft., on 139th Street, near the Southern Boulevard, for the manufacture of brass, bronze and other wire cloth products. Harry Tennenbaum, 530 Main Street, New Rochelle, N. Y., is architect.

The Sturtevant Tool Co., 1023 East 178th Street, New York, plans for the installation of a press, Bliss type No. 18.

The E. V. Stratton Motors, Inc., Washington Avenue, Albany, N. Y., will take bids on revised plans about Dec. 15 for a three-story service and repair building, 100 x 135 ft., on Broad Street, to cost $100,000 with equipment. The Ballinger Co., 100 East Forty-second Street, New York, is architect and engineer. E. V. Stratton is president.

The National Biscuit Co., 35 Ninth Avenue, New York, will commence the erection of a one-story machine and repair shop at 450-60 West Fifteenth Street, 110 x 175 ft., to cost $75,000. James B. Terrance, Rutherford, N. J., is architect.

Carr Brothers, 65 Broadway, New York, exporters, have inquiries out for one portable motor-driven grinder.

The New Zealand Government, Wellington, State Power Department, is perfecting plans for extensions in the Dominion power plants and systems, to include an addition to the generating plant at Hora-Hora; hydroelectric power station completion at Mangahao; hydroelectric generating plant at Arapuni; and an addition to the hydroelectric plant at Lake Coleridge, with two new generating units, each of 7500 kw. capacity.

The Superintendent of Lighthouses, Ketchican, Alaska, will receive bids until Jan. 21 for two internal-combustion engine-driven air compressors, and two oil engines for the Cape Spencer light station, Alaska.

The Pan-American Petroleum & Transport Co., 120 Broadway, New York, is organizing a new subsidiary to be known as the Pan-American Western Petroleum Co., to take over its refining plant and terminal at Los Angeles harbor, now operated in the name of the Pan-American Petroleum Co. A bond issue of $12,000,000 is being sold, of which about $5,000,000 will be used for extensions and additional equipment. E. L. Doheny is chairman of the board of directors.

Michael Fronn, 47 West Forty-second Street, New York, has plans for a two-story ice plant, 100 x 200 ft., at 4901-23 Second Avenue, to cost $100,000 with equipment. Charles Mayer, 31 Union Square, is architect.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a contracting company in Switzerland which will be in the market for American hoisting, digging, concrete-mixing and kindred machinery for a project to be carried out for the Swiss Federal Railway. Reference No. 112440.

The New York & Queens Electric Light & Power Co., Bridge Plaza, Long Island City, has purchased the plant and adjoining site of the Remington Typewriter Co. at Flushing, L. I., and will convert the property for a central repair works, storage and distributing plant.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, is concluding arrangements for the purchase of the electrical property and system of the Flatbush Gas Co., Flatbush and adjoining sections, for $4,500,000. The selling company has been considering extensions to cost about $3,000,000, and the Brooklyn Edison Co. proposes to carry out this expansion.

The Yellow Taxi Corporation, 155 East Forty-fourth street, New York, has leased two floors in the building at 231 East Forty-seventh Street, totaling 40,000 sq. ft. for a new service and repair works; also two floors in the building at 175th Street and the Grand Concourse, aggregating 22,000 sq. ft. to be equipped for similar purposes.

The Baltimore & Ohio Railroad Co., 2 Wall Street, New York, has preliminary plans for the electrification of its line and terminal property on Staten Island, to include the installation of electric power and transmission equipment, estimated to cost $13,000,000. The Long Island Railroad Co. will soon submit tentative plans to the Transit Commission for the similar electrification of its system in the city, and will commence work as soon as approval is received, estimated to cost $60,000,000 with electric power and other machinery.

Fire, Nov. 25, destroyed a one-story unit at the plant of the Illinois Glass Co., Bridgeton, N. J., with loss estimated at $250,000. It is planned to rebuild. Headquarters of the company are at Alton, Ill.

Fire, Nov. 29, destroyed a portion of the plant of the Bushwick Cork Co., 681 Hudson Boulevard, Bayonne, N. J., with loss estimated at $50,000 including equipment. Rebuilding plans are under consideration.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Dec. 18 for two boiler feed pumps for the aircraft naval station, Lakehurst, N. J., Schedule 1654.

The Raritan Hollow Tile Co., Keasbey, N. J., will commence rebuilding its plant destroyed by fire in October, with loss estimated at $100,000, including machinery. The installation will include a new machine room, mechanical drying department and power house. William G. Demarest, Plainfield, N. J., is president, and Robert Lyle, Red Bank, N. J., general manager.

The American Radio Phone & Mfg. Co., Newark, has leased a floor in the building at 28 Prospect Street to manufacture radio head-sets and other wireless equipment. Victor D. Lindeman is president, and George J. Janish, secretary.

Power equipment, transmission and conveying machinery will be installed in the two-story addition, 100 x 100 ft., to be erected at the plant of the Lackawanna Laundry Co., 31-33 High Street, Newark, estimated to cost $95,000. Neil J. Convery, 942 Broad Street, is architect.

The Port Newark Brick Co., Newark, will commence the erection of a plant on a 2½-acre tract at Port Newark, recently leased from the city. It will have a capacity of 190,000 brick per day. A machine shop and power house will be built and later a department for the production of cement tile. The plant is estimated to cost $250,000 with machinery. William E. Lehman, 738 Broad Street, is architect and engineer. William D. Decker, president of the Decker Building Material Co., Inc., 118 Clinton Avenue, is president.

The National Fireproofing Co., Fulton Building, Pittsburgh, is arranging to rebuild its plant at Perth Amboy, N. J., recently destroyed by fire with loss estimated at $400,000 including machinery. W. Guy Weaver is district manager.

New England

BOSTON, Dec. 3.

THE machine tool market has not recovered from the letdown experienced in Thanksgiving week. Current sales are largely confined to single tools, both new and used, which in the weekly aggregate involve a small expenditure. Collectively, November turned out a much better month than was anticipated by the trade. Estimates of sales in this district vary considerably, but average $200,000 to $250,000, not counting auction sales. Two sales approximated $100,000. The outlook for business this month is not generally considered bright, as most industries will take inventories in December or January.

Bids are in on a one-story, 22 x 75 ft. foundry addition contemplated by the Holtzer-Cabot Electric Co., 125 Amory Street, Jamaica Plain, Boston. S. D. Kelley, 46 Cornhill, Boston, is the architect.

Plans are in progress for two repair shops, two stories, 60 x 120 ft., to be built on Foster Street, Worcester, by Harry Mandell, 33 Derby Street. Harry L. Meacham, 571 Main Street, Worcester, is the architect.

The Chism Mail Box Co., Southington, Conn., with a capital of $100,000, has incorporated to manufacture mail boxes. For the present its product will be manufactured by the Edwards Co., Cincinnati, but plans are in progress for acquiring a Southington plant. L. W. Chism, Hartford, is president.

Marcus Mason & Co., Inc., Worcester, Mass., grinding machinery, has purchased the Warren F. Fraser Co., Westboro, Mass., plant which it will shortly occupy. The latter company manufactured machine tools. The Marcus Mason company is an outgrowth of William L. Dines, Jr. & Co. Mr. Dines is superintendent of the plant.

Work is under way on four locomotive shops and engine house for the Central Vermont Railroad Co., St. Albans, Vt., with main machine shop, 90 x 100 ft. A 90-ft. turntable will also be installed. The plant will cost $200,000 with machinery. The Arnold Co., 105 South La Salle Street, Chicago, has the general contract. P. D. Fitzpatrick is chief engineer.

Manual training equipment will be installed in the high school to be erected at Rockland, Me., estimated to cost $100,000, for which bids will be asked on a general contract in February. Bunker & Savage, Augusta Trust Building, Augusta, Me., are architects.

The Blackstone Valley Gas & Electric Co., Pawtucket, R. I., will commence the erection of a power house, 56 x 80 ft., to cost $60,000. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer.

Bids will be asked this month by the Public Works Department, Taunton, Mass., for a municipal electric light and power plant, 30 x 50 ft., with extension 15 x 20 ft., to cost $200,000 with equipment. Jackson & Moreland, 387 Washington Street, Boston, are engineers.

The Enosburg Falls Water Corporation, Enosburg, Vt., plans the installation of electric pumping and power equipment in connection with extensions in its waterworks to cost $75,000. Lewis D. Thorpe, 200 Devonshire Street, Boston, is engineer.

The Baxter Paper Box Co., Freeport, Me., is remodeling the former local high school for a factory and will install machinery to manufacture paper boxes and containers.

The Waterbury Ice Corporation, Waterbury, Conn., has plans for a new plant estimated to cost $50,000.

The Hollingsworth & Whitney Co., 185 Devonshire Street, Boston, manufacturer of paper products, has plans for a new paper and pulp mill on the St. Croix River, St. Stephen, N. B., with machine shop and power house, estimated to cost $400,000 with equipment. The company is operating mills at Waterville and Gardiner, Me.

The New England Machine & Electric Co., Pawtucket, R. I., has awarded a general contract to the Rowley Construction Co., Pawtucket, for a one-story plant on Bayley Street, 73 x 120 ft., to cost about $22,000.

The Central Maine Power Co., Augusta, Me., is considering the construction of a hydroelectric generating plant on the Kennebec River, vicinity of Bingham, Me., with maximum output of about 60,000 hp., estimated to cost $5,000,000, with transmission system.

The General Electric Co., Schenectady, N. Y., has plans for two additions to its works at Bridgeport, Conn., each one story. One structure will be equipped as a machine shop extension and the other for general factory service.

The Acme Mfg. Co., Brewer, Me., manufacturer of pipe clamps, etc., has arranged for the removal of its plant to a one-story building, 52 x 100 ft., at Bangor, Me., where additional equipment will be provided.

Electric power equipment, elevating, conveying and other machinery will be installed in the four-story printing plant, 50 x 60 ft., to be erected by the Waterbury American, Inc., Waterbury, Conn., to cost $175,000. Lockwood, Greene & Co., 101 Park Avenue, New York, are engineers.

Philadelphia

PHILADELPHIA, Dec. 3.

CONTRACT has been let by the Electric Storage Battery Co., Rising Sun Avenue, Philadelphia, to the William Steele & Sons Co., 219 North Broad Street, for a one-story addition.

The Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Merida, Mexico, in the market for wire fence, pipe fittings, tools and tin, from a concern at San Juan, Porto Rico, for plain and galvanized iron roofing, pipe fittings and kindred products.

Fire, Nov. 25, destroyed a portion of the plant of the Camden Forge Co., Camden, N. J., with loss estimated at $25,000 including equipment. It is planned to rebuild.

The Pennsylvania Railroad Co., Philadelphia, has plans for a one-story car shop, 186 x 228 ft., at Camden, N. J., to cost $45,000, to replace a portion of the plant destroyed by fire several weeks ago.

The Delaware County Electric Co., Chester, Pa., operated by the Philadelphia Electric Co., Philadelphia, has purchased property on Sixth Street as a site for a new power house.

The Lancaster Pulley Co., 401 East Chestnut Street, Lancaster, Pa., is having plans drawn for a two-story building at North Ann and Fulton Streets, 42 x 90 ft. Henry R. Herr is head.

W. A. Wilbur, Third and Seneca Streets, Bethlehem, Pa., is planning the installation of a drill press, bench tools and other equipment in the repair department at his automobile service works to replace equipment recently destroyed by fire.

The Pennsylvania Power & Light Co., Allentown, Pa., is perfecting plans for the construction of a hydroelectric generating plant at Hawley, Pa., with initial capacity of about 50,000 h.p.

The Crane Market

A FAIR volume of business is still pending in the New York district, but a strong inclination to delay award continues. Inquiry for hand power cranes is particularly quiet and few new inquiries on electric overhead cranes are noted. Sellers of locomotive cranes are looking forward to some business from the railroads next year. Among current inquiries is that of the J. G. White Engineering Co., 43 Exchange Place, New York, for a 40-ton overhead crane; the Brooklyn Eastern District Terminal Co., Brooklyn, N. Y., for a 25-ton gantry crane; the Tottenville Copper Co., Tottenville, Staten Island, New York, for a 5-ton, 72-ft. span electric crane; and the 14 overhead cranes for the Philadelphia plant of the General Electric Co., Schenectady, N. Y.; one 125-ton, double trolley crane for the Public Service Electric Co., Newark, N. J. The Chicago Board of Education is inquiring for a 1000-lb. electric hoist for the Tilden Technical High School, Sprague hoist or its equivalent being specified. The Merchants Shipbuilding Corporation, Chester, Pa., is offering for sale, the buyer to dismantle and remove, seven open portal tower electric cranes and three electric gantry cranes. The seller will aid with bids from local contractors for dismantling and loading.

Among recent purchases are: Stevens & Wood, 120 Broadway, New York, a 100-ton overhead traveling crane for the Ohio Edison Co., Toronto, Ohio, from the Morgan Engineering Co.

James Stewart & Co., New York, one 2½-cu. yd. and one 3-cu. yd. bucket handling cranes for the Standard Oil Co., Cleveland, Ohio, from the Cleveland Crane & Engineering Co.

General Electric Co., Schenectady, N. Y., a 15-ton overhead crane for Pittsfield, Mass., from the Niles-Bement-Pond Co.

Public Service Electric Co., Newark, N. J., a 125-ton, double trolley overhead traveling crane, one of two inquired for, from the Cleveland Crane & Engineering Co.

Republic Iron & Steel Co., Youngstown, Ohio, an electric jib crane from the Whiting Corporation.

Fairbanks, Morse & Co., Indianapolis plant, a 5-ton electric traveling crane from the Whiting Corporation.

Chicago Steel Foundry Co., Chicago, a 20-ton used locomotive crane from the L. A. Green Machinery Co., Pittsburgh.

Wayne Tank & Pump Co., Fort Wayne, Ind., twelve 1-ton hand power cranes from the Louden Machinery Co., Fairfield, Iowa.

The Harrisburg Gas Co., Harrisburg, Pa., has purchased 13 acres at Steelton, Pa., as a site for a new gas-generating and distributing plant, with steam power house, gas holder, etc., estimated to cost $1,000,000 with machinery. The initial unit, to be completed during 1924, will cost approximately $500,000. L. S. Williams is general manager.

The Keystone Cabinet Co., Littlestown, Pa., has construction in progress on a new plant, and plans for the early installation of electric power and other machinery.

The Floyd-Wells Co., First Avenue, Royersford, Pa., manufacturer of stoves, heaters, etc., has plans for a one-story addition, 90 x 170 ft., with extension, 20 x 25 ft. A. S. Kepner, 121 North Howard Street, Pottstown, Pa., is architect.

Bids will be received by the School District of Norristown Pa., Clarence I. Moore, secretary, until Dec. 11, for pumping machinery and other equipment for the Thomas J. Stewart high school, to be erected on West Marshall Street. Oliver R. Parry, 1524 Sansom Street, Philadelphia, is architect.

E. S. Bullock, First National Bank Building, Williamsport, Pa., will install electric power equipment, woodworking, conveying and other machinery at his two-story box-manufacturing plant, 100 x 115 ft., to cost approximately $100,000.

The Middletown & Royalton Water Co., Middletown, Pa., has been granted permission to install a water power electric plant on Swatara Creek.

The American Ice Co., City Centre Building, Philadelphia, will build a one-story addition to its ice-manufacturing plant at Michigan and Arctic Avenues, Atlantic City, N. J., 45 x 138 ft., to cost $75,000. C. Leslie Weir, 45 East Forty-second Street, New York, is architect and engineer.

Mead & Goodrich, Inc., 350-370 West Third Street, Williamsport, Pa., plan the erection of a three-story automobile service and repair building, 120 x 175 ft., estimated to cost $150,000 including equipment.

Buffalo

BUFFALO, Dec. 3.

PLANS are being perfected by the Precision Castings Co., Inc., Syracuse, N. Y., for expansion in its plant in the Fayetteville section and the installation of additional equipment.

The Tucker Rubber Corporation, Jackson Building, Buffalo, recently organized with a capital of $800,000 by officials of the Federal Rubber Co., Cudahy, Wis., has leased a portion of the former plant of the Madison Tire & Rubber Co. for the manufacture of mechanical rubber goods. It will take over this branch of the business of the parent company, which is affiliated with the Fisk Rubber Co., Chicopee Falls, Mass. Albert Y. Tucker is president and Arthur S. Cullum, secretary and treasurer.

Bids will be asked by the Rochester Refrigerating Co., 50 Meigs Street, Rochester, N. Y., in January, for the erection of a new eight-story plant, 75 x 130 ft., to cost more than $300,000 with equipment. Redfield Tomlinson is president.

The Corning Shale Brick Co., Corning, N. Y., recently organized to take over a portion of the plant and business of the Corning Brick, Terra Cotta & Tile Co., is planning to remodel the works and install additional power and other machinery. M. E. Gregory, head of the selling company, will retain and expand the terra cotta branch of the plant.

The Thomas Furniture Works, 312 Leopard Street, Dunkirk, N. Y., is planning the erection of a new factory to cost more than $65,000 including machinery.

James D. Meehan, Everson Building, Syracuse, N. Y., architect, is preparing plans for a one-story automobile service and repair building at 800 West Genesee Street, 105 x 250 ft., estimated to cost $75,000, for a company whose name will be announced later.

The Genesee Stone Products Co., Batavia, N. Y., is planning the installation of additional equipment, including conveying and hoisting apparatus, air drills, etc. J. W. Foster is superintendent.

Manual training equipment will be installed in the high school to be erected at LeRoy, N. Y., estimated to cost $225,000, for which bonds have been voted. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The Common Council, Hamburg, N. Y., plans for the installation of electric pumping machinery and auxiliary equipment at the municipal waterworks.

The Corning Light & Power Co., Corning, N. Y., contemplates extensions in its plant and system to cost $50,000.

P. H. Serio, 158 Fox Street, Elmira, N. Y., is arranging for the establishment of a local plant to manufacture automobile equipment and accessories.

The United States Light & Heat Co., Highland Avenue, Niagara Falls, N. Y., manufacturer of electric batteries, etc., is planning for the installation of tools and other equipment at its machine shop.

The Wood-Flong Corporation, Stillwater, N. Y., is planning for the installation of a lathe and other tools in its machine shop. A number of beaters and auxiliary equipment will be installed in the paper manufacturing department. C. W. Townsend is general manager.

Pittsburgh

PITTSBURGH, Dec. 3.

ACTIVITY has been lacking in the local machine tool market the past week. Sales have been altogether of single tools and the caution usually observed at this time of the year in the matter of purchases is very marked. One good-sized order has been closed, however, by the Standard Engineering Co., Ellwood City, Pa., and the Pipe Machinery Co., Cleveland, for 38 2-in. and 3-in. threading machines for the Youngstown Sheet & Tube Co., for its Indiana Harbor plant. The Crucible Steel Co. of America is reported to have placed a bar mill for its Labelle works with the Morgan Construction Co., Worcester, Mass.

The building of the Phillips Mine & Mill Supply Co., Pittsburgh, housing the carpenter shop, sheet iron works

and blacksmith shop, recently was damaged by fire. Replacements will be necessary.

Plans are being drawn by the Litlude Battery Co., Morgantown, W. Va., S. J. Steele, president, for a one-story plant at Connellsville, Pa., 37 x 115 ft., to cost about $20,000 with machinery.

The Blair Strip Steel Co., New Castle, Pa., recently organized, has plans for local works for the production of cold rolled steel products, estimated to cost $70,000. George D. Blair, Sr. and Jr., and J. Norman Martin, all of New Castle head the company.

The Bessemer Gas Engine Co., Grove City, Pa., has acquired the rights of manufacture of the oil-operated engines of the Atlas Imperial Engine Co., Oakland, Cal., for all territory east of the Mississippi River, and plans for extensions.

The Otto Chemical Co., Sergeant, near Kane, Pa., is planning the installation of new retorts and other equipment to replace the portion of its plant destroyed by fire Nov. 26, with loss of about $20,000.

S. A. Scott & Co., Richlands, Va., S. A. Scott, president and general manager, have acquired 500 acres of coal property at Weston, W. Va., and will install an electric and mining plant. Electrically-operated coal-loaders will be required.

The Owens Bottle Co., Toledo, Ohio, has purchased 10 acres in the vicinity of its plant at Fairmont, W. Va., and will use a portion of the site for an addition, for which plans will soon be prepared.

The Eastern Sewer Pipe & Brick Co., Dean Buildng, Martinsburg, W. Va., organized with a capital of $350,000, has plans for a new works to cost $200,000 with machinery. A power house will be built. F. Vernon Aler is president and treasurer.

The National Plate Glass Co., Detroit, has awarded a general contract to the McClintic-Marshall Co., Pittsburgh, for an addition to its plant at Blairsville, Pa., estimated to cost $150,000 with equipment.

The Appalachian Power Co., Charleston, W. Va., is disposing of a bond issue of $826,000, a portion of the proceeds to be used for extensions and the installation of additional equipment. Work is in progress on an addition to the steam-operated power plant at Glen Lyn.

Manual training equipment will be installed in the three-story high school to be erected at Coraopolis, Pa., estimated to cost $200,000, for which plans are being drawn by Edward Stotz, Monongahela Bank Building, Pittsburgh, architect.

The West Penn Power Co., West Penn Building, Pittsburgh, will install additional equipment for an increase of 70,000 kva. generating capacity at its Springdale, Pa., power plant, in connection with enlargements.

The Westmoreland Coal Co., 224 South Third Street, Philadelphia, S. Pemberton Hutchison, president, is reported to be planning the installation of electric power and other machinery at its properties on the Spruce Fork of the Little River, Boone County, W. Va.

A manual training department will be installed in the two-story high school to be erected at Clearfield, Pa., estimated to cost $120,000, for which bids will soon be asked on a general contract. Howard & Hatcher, Deposit Bank Building, Du Bois, Pa., are architects.

The Savage Fire Brick Co., Meyersdale, Pa., is planning for extensions in its works at Hyndman and Williams, Pa., and the installation of additional equipment to cost $45,000. F. W. Minch is in charge.

The Pennsylvania Railroad Co., Pittsburgh, will install conveying and unloading machinery at its proposed coal dock at Sandusky, Ohio, estimated to cost $350,000.

Indiana

INDIANAPOLIS, Dec. 3.

BIDS will soon be asked by the Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, for the erection of a one-story addition to its plant at Kokomo, Ind., 150 x 575 ft. Elmer E. Dunlap, Harrison Building, Kokomo, is architect.

The Beatty Machine & Mfg. Co., Hammond, Ind., plans the installation of an air compressor, with capacity of about 1500 cu. ft. per min.

Bids will be received by the Board of County Commissioners, Court House, Indianapolis, Leo K. Fesler, auditor, until Dec. 11, for ovens, power equipment and complete baking machinery for installation in a new one-story plant for which erection bids will be received at the same time.

The Elan Paper Co., Marion, Ind., will break ground for a new mill at Dayton, Ohio, totaling about 75,000 sq. ft. of floor space. The present works will be removed and additional mill machinery installed.

The Crane Co. 836 South Michigan Avenue, Chicago, is having plans drawn for a one-story factory branch on Franklin Street, South Bend, Ind. W. Jerome Clark, company address, is architect.

Donald Test, Central Motor Parts Co., 409 North Capitol Avenue, and E. D. Porter, Jr., vice-president United States Bearings Co., 350 Century Building, Indianapolis, have plans under way for a six-story automobile service and repair building on Monument Circle, estimated to cost $200,000. Bass, Knowlton & Co., 312 North Meridian Street, are architects.

The Home Ice Co., Indianapolis, is contemplating the erection of a two-story ice-manufacturing plant to cost $50,000 with equipment.

The New York, Chicago & St. Louis Railroad, Nickel Plate Line, Cleveland, is having plans prepared for a new locomotive repair shop, machine shop and engine house at Fort Wayne, Ind.

The C. M. S. Mfg. Co., Inc., Mishawaka, Ind., has purchased two buildings from the Dodge Mfg. Corporation in that city, one 60 x 170 ft., and the other 48 x 150 ft. The company manufacturers special factory equipment, conveyors, factory trucks and other material hauling devices.

Detroit

DETROIT, Dec. 3.

BIDS are being taken for a one-story addition, 65 x 280 ft., to the plant of J. C. Widman & Co., 5289 Fourteenth Street, Detroit, manufacturer of automobile equipment, estimated to cost $35,000. Wright & Nice, Genesee Building, Flint, Mich., are architects. J. C. Widman is president.

The C. G. Spring Co., 2642 East Grand Boulevard, Chicago, manufacturer of automobile springs, etc., has acquired the plant of the Detroit Foundry Co., adjoining, totaling about 35,000 sq. ft. of floor space, for an extension to its forging department. Additional machinery will be installed.

The West Michigan Cold Storage Co., Grand Rapids, Mich., W. J. Breen, president, head of the Breen & Halladay Fuel Co., has tentative plans for a new ice and cold storage plant on the Lake Shore, estimated to cost $1,000,000 with machinery.

The Motor Wheel Corporation, Lansing, Mich., will commence the construction of an addition to cost abut $75,000, for the manufacture of gearing and transmissions. The present works will be removed to the new structure and additional equipment installed, the vacated space to be given over to the production of pressed steel wheels.

Manual training equipment will be installed in the new high school to be erected at Grand Rapids, Mich., estimated to cost about $750,000, for which bids will be asked on a general contract Dec. 15. H. H. Turner, Michigan Trust Building, is architect; W. W. Bradfield, Michigan Trust Building, is mechanical engineer.

The City Council, Adrian, Mich., is considering the installation of an electric pumping plant in connection with sewer and waterworks extensions to cost $595,000. The city engineer is in charge.

The Peerless Portland Cement Co., Union City, Mich., has engaged Albert Kahn, 1000 Marquette Building, Detroit, architect, to prepare plans for its proposed mill on a 14-acre tract at River Rouge. It will be one and two-stories, estimated to cost $3,500,000, including machinery and power house. The present Union City mill will be continued. A. F. Miller, Jackson, Mich., is consulting engineer.

Property of the Ryan-Bohn Foundry Co., Lansing, Mich., consisting of 50 acres and main building, 300 x 488 ft., with extension, 40 x 120 ft., will be sold at a public sale on the premises, Dec. 12, by James W. Wilford, receiver. All foundry and operating equipment, with traveling crane, will be included in the sale.

The Reo Automobile Co., Lansing, Mich., will commence the erection of a three-story addition to its local service and repair division, 60 x 150 ft., for which a general contract has been let to the H. G. Christman Co., Lansing.

The Steameter Corporation, Menominee, Mich., recently formed with a capital of $500,000, is contemplating the establishment of a local plant of automatic devices for automobiles, including a meter for automobile radiator water temperatures.

The Rich Steel Products company, Battle Creek, Mich., is again in production after its recent fire which destroyed the warehouse. It has plans for construction in the near future of a new building to replace this unit.

Stockholders of the Wales Stoker Co. have subscribed $10,000 in stock to establish a manufacturing plant at Hills-

dale, Mich. The Alamo Engine Co., of that city, manufacturer of gas engines, will produce the smoke consuming device of the new company. The officers are W. D. Rutherford, president; N. B. Wales, vice-president; W. J. Moore, secretary; William Prideau, treasurer.

The Wolverine Bumper & Specialty Co., Grand Rapids, Mich., has awarded contract for its new brick and steel plant to Hansen, Wharton & Co., Grand Rapids. It will cost $42,000 and the company is planning to be in operation shortly after the first of the year.

The General Motors Corporation, Detroit, will erect an assembling plant for Buick cars at Oakland, Cal., on a site adjacent to the Chevrolet works. Buick business in the Orient and Australia will be taken care of from this new unit.

The Hayes-Ruppel Mfg. Co., Grand Rapids, Mich., manufacturer of plumbing supplies, will move to Grand Haven, Mich., where it will occupy the former Hamilton Motor Co. plant.

The Gartland-Farrell Foundry Co., Sandusky, Mich., has broken ground for an addition, which will increase its floor space 67,000 sq. ft.

The O. L. Anderson Co., Inc., manufacturer of automotive sheet metal parts and copper tubs for washing machines is now settled in its own building at 1347 E. Fort Street. It has a fully equipped tool room and has added a medium sized Bliss toggle press of 150 tons pressure to its press department.

Cleveland

CLEVELAND, Dec. 3.

THE Ford Motor Co. has placed an order with a Cleveland machinery house for 23 machines, including 17 14- to 16-in. lathes and eight shapers, and the Eaton Axle & Spring Co. has purchased nine motor driven grinding machines. With this exception, sales during the week were confined mostly to single machines, for which a fair demand is reported. Dealers generally are doing a satisfactory volume of business for this time of the year, although a slowing down is expected this month and considerable inquiry coming out will probably not result in orders before January. With the exception of the Ford Motor Co., which has continued to buy equipment there is little activity in the Detroit automobile field. Business with some local machine tool manufacturers during November did not hold up in volume to that of October.

Used machinery continues to come out in considerable volume and among the new offerings are 500 machine tools in the plant of the H. J. Walker Co., Cleveland, formerly engaged in the manufacture of automobile motors.

The Henry Furnace Co., Cleveland, will erect a one-story addition, 40 x 100 ft., at 4301 East Forty-ninth Street. The Withington-Roberts-Wright Co., Cleveland, is the architect.

The Youngstown Boiler & Tank Co., Youngstown, Ohio, will shortly begin the erection of two extensions, 40 x 100 ft. and 30 x 200 ft., respectively. Equipment required will include electric cranes and punch presses.

The Dill Mfg. Co., 694 East Eighty-second Street, Cleveland, maker of automobile steering wheels, will erect a three-story addition 30 x 60 ft. and add two stories to the present one-story building.

The Jones Brothers Structural Steel Co., Ravenna, Ohio, has commenced the erection of extensions which will double the company's present capacity.

The plant of the Cleveland Rubber Mould Foundry & Machine Co., Warner Road, Cleveland, including a foundry, 110 x 350 ft., pattern shop and other buildings, has been sold to the Occo Realty Co., a subsidiary of the Ohio Confectionery Co., which contemplates adding a two-story brick building, 120 x 130 ft.

The Hickok Producing Co., Toledo, Ohio, has acquired a 30-acre site adjoining its present plant on which it will erect a new oil refinery at an estimated cost of $500,000. It is also reported that the Standard Oil Co. is planning extensions to its Toledo refinery.

The city of Lorain, Ohio, will shortly take bids for waterworks improvements, involving an expenditure of $90,000, and including filter beds, pipes, valves, etc., for 5,000,000 gal. daily capacity. Morris Knowles 662 Hanna Building, Cleveland, is the consulting engineer.

The city of Fostoria, Ohio, has completed plans for additions to its waterworks department, for which bids will be received early in 1924. Equipment required will include two 150 hp. boilers and a reciprocating steam pump. The estimated cost is $40,000. George Champe, 610 Nasby Building, Toledo, is the engineer.

Plans have been prepared for the new $200,000 sewer pipe factory to be erected in Uhrichsville, Ohio, by the Federal Collieries Co., 722 Leader-News Building, Cleveland. A power plant in which will be installed three 250 hp. boilers, mechanical stokers and a generator of about 500 kw. capacity is included.

The Ferro Machine & Foundry Co., whose Cleveland plant is near East Sixty-sixth Street and Hubbard Avenue, has recently awarded contract for a cleaning building 120 x 200 ft., one story, monitor type, to the H. K. Ferguson Co. for completion in 60 days. A. G. Simon is engineer for the Ferro company.

The Ohio Power Co., New Philadelphia, Ohio, has preliminary plans for a new power substation near the city limits, estimated to cost $1,000,000 with equipment.

Manual training equipment will be installed in the two-story junior high school to be erected at Willoughby, Ohio, estimated to cost $160,000, for which plans are being prepared by Franz C. Warner, Hippodrome Annex Building, Cleveland, architect.

The Sidney Brass Works Co., Sidney, Ohio, operating a machine shop and brass foundry, is planning for the installation of additional equipment.

The Lake Shore Electric Railway Co., Columbus Avenue, Sandusky, Ohio, is planning for a new power house to cost $55,000.

The Timken Roller Bearing company, Canton, Ohio, has planned an expansion program to enlarge its steel mill and roller bearing division at an estimated cost of $700,000 to $750,000.

Chicago

CHICAGO, Dec. 3.

WHILE inquiries for machine tools still greatly outnumber orders, buying showed some improvement as November closed, and a number of machine tool houses report sales for the month slightly heavier than those for October. It is notable, however, that the bulk of the business consisted of scattered orders for single tools. One of the most important recent transactions was the sale of two large motor-driven planers to the Studebaker Corporation, South Bend, Ind. A Chicago buyer has closed for two special heavy turret lathes and a heavy 12-spindle cluster drill. The city of Chicago has taken bids on a 20-in. shaper for one of its pumping stations. A local concern which is erecting a new shop, has put out an inquiry for $25,000 worth of machine tools.

New railroad inquiries are few. The Atchison, Topeka & Santa Fe has entered the market for a 20-in. x 10-ft. engine lathe. The New York Central list has aroused interest here to the extent that dealers hope to participate in the orders which are placed for the Elkhart, Ind., shops.

Prices remain substantially unchanged except for slight reductions on a line of emery grinders and small electric drills.

Outstanding among recent inquiries is one from the Chicago Board of Education for the following equipment for the Tilden Technical High School:

Ten geared-head 12-in. x 5-ft. engine lathes.

One 16-in. shaper.

One No. 1 or No. 2 universal milling machine.

Two Pridmore, or equal, 8-in. power squeezers with molding machine table, 14½ x 18 in., and 30 in. between strain rods.

One Sprague electric hoist, or equal, 1000 lb. capacity.

One Heintz, or equal, electric vulcanizer, arranged for 110-volt d. c. with 6 tube clamps.

Two Lowe, or equal, electric sifting machines, arranged for 110-volt d. c.

Two electric vibrating machines, arranged for 110-volt, 60-cycle a. c.

One No. 2 Whiting cupola, or equal.

One Roots positive pressure blower driven by 7½ hp. motor, arranged for 110-volt a. c. with variable speed control, 25 per cent speed regulation below normal.

The Whiting Corporation, Harvey, Ill., has taken the following orders for foundry equipment: One No. 9½ cupola for Campbell, Wyant & Cannon, Muskegon, Mich.;

one No. 5 cupola for the Austin Co., engineer, Cleveland; one No. 3½ cupola for the Mississippi Foundry & Machine Co., Jackson, Miss.

The Alton File Co., 1015 East Broadway, Alton, Ill., recently incorporated with $30,000 capital stock, manufactures files and rasps and has a plant fully equipped. Officers are M. D. Barker, Springfield, Ill., president; J. J. Rubenstein, Alton, treasurer; and C. W. Beall, Alton, secretary.

The Haywood Bros. Co., Petersburg, Ill., recently incorporated with $40,000 capital stock, is the successor to Haywood Brothers, and produces the Haywood mile stretcher, a vaporizer for motor car engines, and a combination bumper and fender brace for Ford cars. These products are now being manufactured on contract, but the company contemplates building a plant within the next two years. The officers are: President, J. S. Hayward; vice-president, D. M. Altig; secretary, S. L. Shaw; treasurer, S. E. Watkins.

J. C. Mehan & Co., 6136 Broadway, Chicago, recently incorporated with $50,000 capital stock, are manufacturing a manifold heater under the trade name of Go-Kwik, together with time switch attachment. At present the company's operations are confined to the assembling of parts manufactured elsewhere. Officers are J. C. Mehan, president; R. D. Grant, vice-president; J. D. Tyler, treasurer; J. W. Ogren, secretary.

The Continental Can Co., New York, will take bids through Francisco & Jacobus, 39 South LaSalle Street, Chicago, on the general contract for a three-story reinforced concrete plant on West Grand Avenue, Chicago, to cost $500,000.

The Lincoln Products Co., manufacturer of shock absorbers, has purchased a tract, 125 x 400 ft., at the corner of Shubert Street and Kildare Avenue, Chicago, on which the Austin Co., Cleveland, is now erecting for it a one-story factory containing 27,500 sq. ft.

The Nugent Steel Foundry Co., 1800 West Thirty-first Street, Chicago, has awarded a general contract for a two-story pattern storage building, 41 x 121 ft., to cost $30,000.

C. C. Weinz, 74 West Washington Street, Chicago, has awarded contract for a four-story engraving plant, 93 x 100 ft., 914-20 North Franklin Street, Chicago, to cost $45,000.

The Gier unit of the Motor Wheel Corporation, Lansing, Mich., has awarded a contract for an addition, 100 x 380 ft., to cost $70,000.

The Caspers Tin Plate Co., 2259 Oakdale Avenue, Chicago, has purchased a three-story plant at the corner of Thirty-seventh Street and Jasper Avenue.

George and Arthur Zieber have purchased a site at 4623 West Harrison Street, Chicago, for the erection of a structural steel plant.

The Charles Stecher Co., Inc., manufacturer of automatic machinery, 2301 Knox Avenue, Chicago, has sold its one-story plant containing 15,000 sq. ft. of floor space, to the National Regulator Co., manufacturer of steam heating appliances, 208 South Jefferson Street, and has purchased property at Greene Avenue and Altgeld Street where it is erecting a new plant to cost $30,000.

The Pittsburg Boiler & Machine Co., Pittsburg, Kan., has purchased the Salt Lake Iron & Steel Co., Salt Lake City, Utah, and will continue to operate it under the same name. The Salt Lake plant, however, will be enlarged at an expenditure of approximately $500,000. W. H. Sagstetter, vice-president of the Pittsburg Boiler & Machine Co., will also be president of the Salt Lake Iron & Steel Co., with offices at Salt Lake. The Salt Lake plant has specialized in the manufacture of sugar beet and copper mining and smelting machinery, but will be equipped also to handle machinery for coal mining and for reconditioning railroad locomotives.

Joseph Crass has purchased the St. Clair Sheet Metal Works at B and First Streets, Belleville, Ill.

The Duro Metal Products Co., 360 East Grand Avenue, Chicago, has purchased a site, 125 x 400 ft., at Shubert and Kildare Avenues, and will erect a plant to cost $100,000.

A two-story factory, occupied by the Chicago Wheel Mfg. Co. and the Yaxlie Mfg. Co., 1101 West Monroe Street, Chicago, was recently damaged by fire.

The Illinois Central Railroad Co., Chicago, has preliminary plans for new locomotive shops, engine house and oil station at Sioux City, Iowa, to cost about $500,000 with equipment. The installation will include an 85 ft. turntable.

Work will commence on an addition to the municipal electric light and power plant at Denison, Iowa, to include the installation of additional equipment. Jacob Johnson is city clerk.

The Studebaker Sales Co., 427 North Franklin Street, Minneapolis, Minn., will take bids for a three-story service and repair building at Ninth and Franklin Streets, estimated to cost $100,000. M. E. Berry is vice-president and general manager. P. D. Bentley, 1005 Guardian Life Building, is architect.

The Northern States Power Co., Minneapolis, Minn., is disposing of a note issue of $10,000,000, a portion of the proceeds to be used for extensions and the construction of additional power plants. J. J. O'Brien is vice-president.

The Domestic and Foreign Commerce Department, Chicago Chamber of Commerce, 10 South La Salle Street, has received an inquiry from a company at The Hague, Holland, desiring to purchase American machinery for the manufacture of hacksaw blades, No. 2531; from a concern at Havana, Cuba, for machinery and tools, No. 2536; from a company at Torreon, Coahuila, Mex., for American machinery for the manufacture of drain tile, brick, etc., No. 2525; and from a company at Vryheid, Natal, South Africa, for electrically-operated refrigerating machinery, No. 2533.

The Iowa Railway & Light Co., Cedar Rapids, Iowa, will build an addition to its generating plant, with installation of a new 10,000 kw. capacity generator and auxiliary machinery, to develop a total output of 40,000 kw. It will cost about $365,000.

C. A. Kerber, 440 Chicago Street, Elgin, Ill., has inquiries out for a boring machine and a chain hoist.

The Nebraska Power Co., Omaha, Neb., has plans for a three-story generating plant at Twentieth and Howard Streets, estimated to cost $700,000 with machinery. J. T. Davidson is general manager.

Milwaukee

MILWAUKEE, Dec. 3.

BEYOND a scattering demand for machine tools for quick needs, which are filled out of stock, there is very little bulk to current sales. Inquiry continues active and appears to be growing broader, but in nearly every case is for equipment for next year's needs. There seems to be no question, but that the passing of the old year will witness a revival in sales, but the most expected of December is a freshening of inquiry and a casual demand. The outlook for new business among foundries and machine shops has improved appreciably.

The Simms Foundry Corporation, Racine, Wis., is increasing its authorized capitalization from $500,000 to $1,000,000 for financing enlargment of its production, principally pipe and pipeless furnaces for domestic and small industrial heating. The present capacity of 10,000 furnaces annually is to be doubled by the middle of 1924. Five acres have been purchased adjacent to its foundry on Layard Avenue for extensions. Details are not yet available. Horace R. Simms is president and general manager.

The Northwestern Fence & Wire Co. of Milwaukee has been incorporated with a capital stock of $50,000 to succeed the firm of same name established several months ago at 290 Third Street to wholesale and job fencing, wire work and kindred merchandise. It is now planned to engage in manufacturing as well. Steps will be taken early in the new year to provide a factory. W. G. Clark, J. L. Selbo and D. V. Holcombe are the principals.

The Cumberland, Wis., Auto Co., R. L. Kuenzli, proprietor, has plans for a new garage, sales and service building, two stories, 50 x 120 ft., to be erected early next spring at an estimated cost of $28,000.

The Steel Products Corporation, Sheboygan, Wis., which has been incorporated with $100,000 capital stock, will manufacture automobile equipment, principally a steel bumper for passenger cars. It is taking over the bumper business developed by the Jenkins Machine Co., Sheboygan, and will establish a new factory which requires a small list of machinery, including shears, hacksaws, drills, presses, etc. The Jenkins company will devote the space released by the transfer to enlarging its output of woodworking machinery. Fred Zschetzsche, 426 Grant Street, is president and general manager of the new corporation.

The Wausau Parts Mfg. Co. of Wausau, Wis., organized recently with $50,000 capital, has changed its name to the Wausau Motor Parts Co., as its principal business will be to manufacture automotive equipment, accessories and small units. A plant is now being equipped in leased quarters but a new building is planned next year. W. F. Scholfield is general manager.

The Prime Mfg. Co., 653 Clinton Street, Milwaukee, manufacturer of brass castings, railroad specialties, etc., expects to start work Feb. 1 on the erection of a new brass foundry, 60 x 120 ft. Plans for the building and specifications for the equipment are being prepared by Frank D. Chase, Inc., industrial engineer, Chicago. Orton L. Prime is president and general manager.

The Bayley Heating & Supply Co., 181-183 Sycamore Street, Milwaukee, has let the general contract to Klug & Smith, consulting engineers, Mack Block, for a two-story shop, office and warehouse building, 59 x 112 ft., at 2113-2115 St. Paul Avenue. Figures are being taken on miscellaneous pipe shop equipment and other requirements.

The DePere, Wis., board of water commissioners is asking bids until Dec. 11 for two air-lift pumps and one centrifugal pump and engine as part of a water supply enlargement project, including the reaming of present wells to 10-in. and casing with 8-in. Byers wrought iron pipe. The work is in charge of W. G. Kirchhoffer, consulting engineer, Madison, Wis. M. J. Maes is secretary of the board.

The Kurz Motor Car Co., 1107 College Avenue, Appleton, Wis., will build a two-story and basement addition, 45 x 87 ft., to its garage, sales and service building. It will cost about $25,000 complete.

The Milwaukee Board of School Directors has instructed Van Ryn & DeGelleke, 115 Grand Avenue, city school architects, to prepare plans for a boys' pre-vocational school, an elementary school and an addition to the Cass Street school, the combined cost being estimated at $750,000. Construction bids probably will not be taken until after Jan. 15. Frank M. Harbach is secretary and business manager of the board.

The Townsend Co., Janesville, Wis., has been incorporated with a nominal capital of 100 shares of common without par value and 50 shares of preferred at $100 par value, to manufacture tractors, gas engines, vehicles and mechanical devices. It will take over the business of R. C. Townsend, who a year ago purchased the principal assets of the bankrupt Townsend Mfg. Co. Enlargement of production is planned.

The Board of Education, Schlesingerville, Wis., has engaged Siewert & Fries, architects, 3601 North Avenue, Milwaukee, to make plans for remodeling and an addition to the high school building to provide vocational training departments. An expenditure of $75,000 is planned. A. J. Kletti is secretary.

The Curtis Automobile Co., 143 Eighth Street, Milwaukee, has let the general contract for its new headquarters at Broadway and Martin Streets to S. M. Siesel & Co., 160 Ogden Avenue, local. It will be 100 x 127 ft., three stories and basement, and cost $200,000. Equipment needs are being prepared and estimates will be taken soon. The Federal Engineering Co., 444 Milwaukee Street, is in charge.

The Eslien Sheet Metal Works, 1001 Thirtieth Street, Milwaukee, has plans by C. F. Behnke, local architect, for a three-story brick and concrete building, 60 x 120 ft., to replace the original factory destroyed by fire several months ago. It specializes in the manufacture of portable steel garages and other buildings of this size and will need considerable sheet metal-working machinery, riveting and welding units, shears, presses and other equipment. The total investment will be about $75,000.

South Atlantic States

BALTIMORE, Dec. 3.

THE Lafayette Mill & Lumber Co., Lafayette Avenue and Pennsylvania Railroad, Baltimore, will build a three-story brick plant at Mosher and Brice Streets, 95 x 100 ft., to cost $75,000.

The Reliable Furniture Mfg. Co., 303 President Street, Baltimore, will build a two-story brick plant, 262 x 274 ft., at Ridge Road and Whittenmore Avenue, at a cost of $180,000.

The Porcelain Enamel & Mfg. Co., Baltimore, has acquired a site adjoining the plant of the Wolverine Enameling Co., a subsidiary, at Detroit. The property will be used for an extension to the Wolverine works and plans are now being prepared.

Contract has been awarded by the Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, to the Charles L. Stockhausen Co., Water Street, Baltimore, for a four-story and basement addition to its plant on Frederick Avenue, 60 x 140 ft., known as the Rennous-Kleinle Division, estimated to cost $150,000 with equipment. Wight & Lockhardt, Baltimore, are architects.

The Clermont Land Co., Liberty Trust Building, Roanoke, Va., J. Tracy Walker, treasurer, has inquiries out for tile-manufacturing machinery, power and other equipment for a plant estimated to cost $60,000.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Dec. 18, for tools for Eastern and Western yards, including 204 cutting punches, 1200 center punches, 108 machinists' dividers, 46 calipers, 148 spring calipers, 204 carbon steel countersinks, 276 countersinks and drills, 1132 setting dies, 261 hand drills, 2416 hacksaw frames, 936 hammers, 100 hand saws, 120 hand saws, 24 combination set squares, 600 caliper rules, 90 steel measuring tapes, and other equipment, schedule 1606; also for miscellaneous steel wire rope, schedule 1645; and, until Dec. 28, for the Puget Sound navy yard, pumps and spare parts, schedule 1655.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will build an addition to its power house at 112-16 Hopkins Place, 40 x 70 ft., to cost about $65,000.

D. C. Elphinstone, 408 Continental Building, Baltimore, machinery dealer, has inquiries out for one portable rock crusher on wheels, to handle large size material.

E. L. Vace, Tifton, Ga., is in the market for a four-side planer for lumber service.

The Bureau of Foreign and Domestic Commerce, Washington, has information of a company at Rio de Janeiro, Brazil, in the market for American mining machinery, including drills, air compressors, hauling machinery; crushing, sieving and classifying machines, No. 8248; also of a company at the same location desiring to purchase refrigerating machinery, No. 8246; of a concern at Caracas, Venezuela, in the market for harbor dredges, hydraulic and bucket, No. 8309; a company at Aleppo, Syria, desiring ice-manufacturing machinery, No. 8241; a company at Guaratuba, Brazil, in the market for ice-making machines, fertilizer-manufacturing machinery, and similar equipment, No. 8216; and a concern at Roudnice, Czechoslovakia, desiring to purchase machinery for the manufacture of corks and wooden stoppers, and corking machine, No. 8252.

The Victory Mfg. Co., Rockingham, N. C., recently organized, is perfecting plans for the establishment of a machine shop and foundry. F. I. Mason is president and general manager.

Cold storage and refrigerating plants will be installed in the three meat-packing buildings to be erected by Alouf Brothers, Roanoke, Va., estimated to cost $75,000, exclusive of machinery, to be occupied by Armour & Co., Swift & Co., and Morris & Co., all of Chicago.

The Electric Hose & Rubber Co., Twelfth Street, Wilmington, Del., is planning the installation of a boring lathe, about 24-in. swing.

The Hunter Machinery Co., Marion, N. C., machinery dealer, is in the market for a return tubular boiler, about 80 hp. capacity, with auxiliary equipment.

The American Glass Co., Broad and Meadow Streets, Richmond, Va., has inquiries out for a 100 hp. engine, oil-operated, and auxiliary equipment.

The Central of Georgia Railroad Co., Savannah, Ga., is considering other sites for rebuilding its local car shops recently destroyed by fire with loss of $750,000, and purposes to establish the works where land for expansion is available.

The Georgia Railway & Power Co., Atlanta, has issued preferred stock for $1,400,000, a portion of the proceeds to be used for extensions. The company has plans for two hydroelectric generating stations to be constructed and placed in operation in 1924 at Mathis and Tugaloo, Ga. An addition will also be built to the present hydroelectric plant at Bull Shine. Two new hydroelectric stations will be erected at Leeds and Burton, Ga. H. M. Atkinson is chairman of the board.

The Savannah & Atlanta Railway Co., Savannah, Ga., has tentative plans for the manufacture of cross arms and kindred timber material, and will be in the market for equipment, including a gang-boring machine, edge-chamfering machine, transmission equipment, etc. R. G. Cox is superintendent.

The Watson-Fitzgerald Co., Danville, Va., is in the market for electric motors, 3, 5, 20 and 25 hp. each, 60 cycle, 220 volts.

The Graniteville Mfg. Co., Graniteville, S. C., is desirous of getting in touch with manufacturers of wire coil springs, with view to purchase in quantity.

The United States Industrial Alcohol Co., 110 East Forty-second Street, New York, has preliminary plans under way for an addition to its plant at Curtis Bay, Baltimore, for the manufacture of fertilizer, estimated to cost $50,000.

R. P. Johnson, Wytheville, Va., machinery dealer, is in the market for a gyratory crusher, with capacity of 400 to 500 tons per day, with elevator, screens and auxiliary equipment.

The Fisheries Products Co., Wilmington, N. C., has acquired a portion of the former local plant of the Carolina Shipyards, and will remodel for a repair plant for company boats. Thomas B. Hayes heads the company.

The Republic Products Co., 2 East Redwood Street, Baltimore, has inquiries out for metal-working equipment, including punch presses, drill presses, small milling machines, dies, jigs, bench tools, etc.

Gulf States

BIRMINGHAM, Dec. 3.

FIRE, Nov. 22, destroyed a portion of the plant of the Washington Cotton Oil Co., Maple Avenue, Dallas, Tex., with loss estimated at $50,000 with equipment. It is planned to rebuild. Headquarters of the company are at Memphis, Tenn. W. L. Patton is local manager.

The Goethe Lumber Co., Manning, Fla., is in the market for a stationary steam engine and auxiliary equipment.

F. H. Jones, 200 Commerce Street, Fort Worth, Tex., has plans for a three-story automobile service and repair works estimated to cost $100,000, including equipment.

The National Petroleum Co., Dallas, Tex., has preliminary plans for the installation of a pipe line and pumping plants from the Postoak oilfields, Marlin, Tex., to the San Antonio & Aransas Pass Railway, estimated to cost $100,000. The Postoak Oil Co., Marlin, H. L. Pinkerton, president, is interested in the project.

The San Antonio Portland Cement Co., San Antonio, Tex., will commence the construction of additions to its mill, including the installation of additional equipment, estimated to cost $100,000. W. E. Simpson, National Bank of Commerce Building, is engineer.

The Wichita Falls Cotton Oil Co., Wichita Falls, Tex., is planning to rebuild the portion of its plant recently destroyed by fire with loss estimated at $17,000, including equipment.

J. M. Gillespie, P. O. Box 128, Tavares, Fla., has inquiries out for one electrically-operated deep-well pump, with windmill, steel tower, steel tank and auxiliary equipment.

Plans are being arranged for a cold storage and precooling plant at Lake City, Fla., to be used in connection with fruit shipments. George L. Colburn, secretary of the local Rotary Club, is inquiring for information and equipment. It is purposed to organize a company to operate the plant, which will have an initial capacity of about 4 cars daily.

The Deal Lumber Co., Buhl, Ala., is in the market for five high pressure boilers and auxiliary equipment.

Manual training equipment will be installed in the high school to be erected at Tuscaloosa, Ala., estimated to cost $250,000, for which bids will be taken on a general contract before the end of the month. D. O. Whilidin, Birmingham, is architect.

The Mission Ice Co., San Antonio, Tex., has tentative plans for a new plant estimated to cost $150,000, including machinery.

The Reese S. Allen Refinery, Amarillo, Tex., has preliminary plans for the installation of a pipe line from its plant to the Carson-Hutchinson oilfields, about 42 miles, with a series of pumping plants. It is estimated to cost $500,000.

John W. Kitchens, Heflin, Tex., has acquired the local electric power plant heretofore operated by R. M. Dobbins. Extensions will be made and additional equipment installed.

A bond issue of $50,000 has been voted at a special election at Lubbock, Tex., for extensions in the municipal electric power plant and the installation of additional equipment.

The Southwestern Gas, Light & Power Co., Fort Worth, Tex., recently organized with a capital of $700,000, to take over light and power properties at Breckenridge, South Bend and vicinity, has tentative plans for extensions in the different stations and the installation of considerable power equipment.

The Roth Brothers Auto Supply & Machine Co., 317 North Flores Street, San Antonio, Tex., has awarded a general contract to Edward W. Oeffinger, College Street, for a new two-story plant, 100 x 120 ft., for rebuilding motors and other electrical machinery, automobile parts, repairs, etc. It will cost about $45,000. Edward S. Green, Alamo Bank Building, is architect.

S. M. Regar, machinery and mill supplies, 212 South Franklin Street, Tampa, Fla., is in the market for a second-hand 50 kw., 110 volts, direct connected generator, with instrument board.

The Universal Polish Mfg. Co., 911 Camp Street, Dallas, Tex., is making inquiries for automatic filling and capping machines.

The Gulf Coast Lines, Brownsville, Tex., are perfecting plans for new repair and machine shops, with engine house, estimated to cost $100,000 with equipment.

The McEwan Shipbuilding & Repairing Co., Port Arthur, Tex., is said to have purchased dry dock property at Jacksonville, Fla., and contemplates the removal of its plant. Additional equipment will be installed. The entire project will involve about $500,000.

The Mexico Hardware Co., El Paso, Tex., will equip a small wire nail plant in Ciudad Juarez, Mex., across the Rio Grande from El Paso. It will have an initial daily capacity of about two tons of nails, but will be enlarged in the future. The Mexican duty on wire nails is 20 centavos per kilo, while on wire it is only 3½ centavos. S. R. Silva is president and general manager of the company.

The El Paso Cotton Mill Co., El Paso, Tex., has been incorporated with $500,000 capital stock and early next year will start work on a cotton mill to have an initial capacity of 5000 spindles. The equipment has not yet been purchased. J. Paul Henderson is vice-president and general manager.

The Universal Gypsum Co., G. E. Williams, vice-president, will start work soon on a 200-ton capacity plant at Rotan, Tex. The company is now operating plants at Dodge City, Iowa and Batavia, N. Y.

St. Louis

ST. LOUIS, Dec. 3.

A BOND issue of $50,000 has been approved at Bolivar, Mo., for the installation of a municipal electric light and power plant, for which bids will soon be called. Otis Jarman is city clerk.

Electric pumping machinery will be installed at the new waterworks to be constructed at Enid, Okla., estimated to cost $1,000,000, for which bids will be asked in the near future. J. D. Bomforo, Masonic Temple, is architect.

The Hammer Iron Works, South Sixth Street, Fort Smith, Ark., will install a 10-ton traveling crane at its proposed plant on site recently purchased, for which plans will be drawn at once. It will cost about $22,000. A hydraulic wheel press and other machinery will also be purchased.

The Northwest Arkansas Utilities Corporation, Fayetteville, Ark., has been organized with a capital of $500,000 to take over and consolidate the Fayetteville Gas & Electric Co.; Springdale Gas & Electric Co., Springdale, Ark.; and the Rogers Light & Power Co., Rogers, Ark. Plans are under way for extensions, including the installation of additional equipment. V. McDaniels, superintendent of the Fayetteville company, will act in the same capacity with the consolidated organization.

The Hanlon Gasoline Co., Tulsa, Okla., recently organized under Delaware laws with capital of $1,500,000, will take over the plant and properties of the Hi-Power Gasoline Co. The new company plans the construction of a new refining plant to cost approximately $300,000 with machinery. It will be closely affiliated with the Chestnutt & Smith Corporation, Tulsa, operating oil refineries in this vicinity.

The Common Council, Heavener, Okla., will install electric pumping machinery at its waterworks plant, estimated to cost $150,000, for which plans will be drawn by V. V. Long & Co., 1300 Colcord Building, Oklahoma City, Okla.

The Merchants Ice & Coal Co., St. Louis, has engaged A. B. Groves, St. Louis, architect, to prepare plans for a two-story ice-manufacturing and refrigerating plant at 4330 Finney Street, to cost $45,000 with machinery.

The Missouri Rubber Products Co., Springfield, Mo., is perfecting plans for new works, 100 x 300 ft., estimated to cost $200,000 including machinery. E. E. Love is construction engineer, in charge.

The Borough Council, Farmington, Mo., will install electric pumping machinery at its proposed waterworks and sewerage system, estimated to cost $100,000. C. A. Haskins, 517 Finance Building, Kansas City, Mo., is engineer.

The Dewey Portland Cement Co., 301 Mutual Building, Kansas City, Mo., will commence enlargements at its mill at Dewey, Okla., including the installation of additional equipment. F. E. Taylor is president.

The Common Council, Hooker, Okla., is planning for the installation of a municipal ice-manufacturing plant. L. C. Crutchfield is city clerk.

The Producers' Cold Storage Co., Chillicothe, Mo., will build a new two-story cold storage and refrigerating plant at Trenton, Mo., to cost about $40,000.

The Atchison, Topeka & Santa Fe Railway Co., Railway Exchange Building, Chicago, plans enlargements in its shops at Emporia, Kan., with machine shops, power house and other structures, estimated to cost $500,000 with equipment. H. W. Wagner, Ninth and Jackson Streets, Topeka, Kan., is chief engineer.

The Inter-Southern Radio Corporation, 208 East High Street, Jefferson City, Mo., recently organized, will establish a plant for the manufacture of radio headsets and kindred wireless products. Bids for machinery will be received in January. Ernest L. Schneider is president and general manager.

Manual training equipment will be installed in the three-story and basement high school to be erected at Bristow, Okla., estimated to cost $135,000, including equipment. C. Lee Curran, 204 Groom Building, is architect. Bids will be asked on a general contract at an early date.

Cincinnati

CINCINNATI, Dec. 3.

WHILE there has been some let-up in buying, a fair number of orders for machine tools continue to be booked. These are generally for one and two machines, although some of the larger companies are reported to be quietly purchasing equipment without the formality of sending out general inquiries. Some export orders were booked the past week, mostly for South American countries. The Ford Motor Co. is reported to have placed several large orders recently, one for 75 special machines to be built by a Cincinnati manufacturer. The Westinghouse Electric & Mfg. Co. continues a good purchaser, closing for three lathes the past week.

The Norfolk & Western Railroad is reported to have purchased a number of tools, a hang-over from its recent list. The Cincinnati, Indiana & Louisville Railroad is inquiring for two engine lathes, and the Minneapolis & St. Louis for three engine lathes. It is said that lists are in preparation by the Norfolk & Western, Seaboard Air Line, Virginian and Sante Fe railroads, and will be issued after the first of the year. The New York Central has not closed on its recent list and has put out new inquiries for three 14-in. engine lathes.

The U. S. Engineers' Office, Louisville, Ky., will take bids until Dec. 29 for furnishing and delivering metal work for Dams Nos. 44 and 45, Ohio River. Further information on application.

The Hoppes Water Wheel Co., Springfield, Ohio, has been organized to take over the plant and business of the Trump Mfg. Co., manufacturer of water wheels. It will manufacture, in addition to water wheels, a new hydro-electric unit designed by John J. Hoppes, for use by small stream owners and for auxiliary light and power in large plans. Capt. John Lund, Washington, is financially interested in the new company, which will be headed by John J. Hoppes as president; Captain Lund, vice-president and general manager, and R. P. Henderson chief engineer.

The city of Dayton, Ohio, will shortly commence the erection of a garbage disposal plant to cost, with equipment, about $100,000. It is hoped to have the new plant in operation in June. H. E. Eichelberger is city manager and has charge of the work.

The Birmingham Machine Co., Marietta, Ohio, has moved into larger quarters at Third and Butler Streets. Some new equipment has been purchased. The company does a general machinery business, with particular attention paid to oil country work. George Birmingham is head of the company.

Bonds have been authorized by citizens at Union City, Tenn., for $125,000, the proceeds to be used for a municipal electric generating plant and city sewerage works, for which plans will soon be prepared. The Common Council is in charge.

The Perfection Brake Co., Barnard Street, Cincinnati, has filed plans for a new one-story factory at 2424 Spring Grove Avenue, to cost $19,000. Kruckemeyer & Strong, Cincinnati, are architects.

The Hamilton Metal Products Co., Hamilton, Ohio, will take bids for a two-story and basement addition, 60 x 200 ft., estimated to cost $50,000, with equipment. George Barkman, Reily Building, is architect.

Bids will be received by the city clerk, Elizabethtown, Ky., until Dec. 17, for four centrifugal pumps, with motors and auxiliary equipment, for installation at the muncipal waterworks. B. H. Klyce, Room 720, Fourth and First National Bank Building, Nashville, Tenn., is engineer.

The Crissey Tire & Rubber Co., Columbia, Tenn., has leased property on the Pulaski Turnpike and will have plans drawn for a new works. It is estimated to cost $60,000, with equipment.

Canada

TORONTO, Dec. 3.

WHILE demand was confined chiefly to small lots, total business in machinery and tools during November proved very satisfactory, according to local dealers. Inquiries are numerous and there is sufficient business pending to assure a steady trade for some time. The automotive industry continues to furnish a good demand for machine tools. The Ford Motor Co. of Canada has completed the erection of a new plant at Toronto and has installed some equipment, but is awaiting delivery on other tools which, when installed, will greatly facilitate production. The Ford company is also busy on the construction of its plant at Ford, Ont., where some $6,000,000 is being spent.

Small lists are appearing from time to time from the Canadian National and Canadian Pacific railroads for tools for shop replacements, but no large lists have been issued. An active demand is also reported for equipment for electrical development projects and considerable improvement has recently appeared for mining machinery.

The Excelsior Lumber & Shingle Co., Vancouver, B. C., is preparing to erect a sawmill to cost $50,000.

F. Leslie, 718 Somerset Street West, Ottawa, Ont., will purchase equipment for the manufacture of tinware, etc.

Bruce & Price, 159 Prince Street, Montreal, are interested in the purchase of foundry equipment.

The St. Laurent Quarry, St. Laurent, Que., is in the market for stone cutting machinery and equipment. C. Lapalieur is mañager.

R. De Montigny, 1396 St. Dominique Street, Montreal, will purchase machinery for the manufacture of cement blocks, etc.

F. H. Plant, Ltd., 111 Murray Street, Ottawa, Ont., is interested in the purchase of equipment for a machine shop.

The Canada Wood Specialty Co., Orillia, Ont., is preparing to erect a factory to cost $85,000.

The Riordon Co., 355 Beaver Hall Square, Montreal, is preparing to build a power house on the Gatineau River near Chelsea Falls, Que., for which the contract will soon be awarded. The Montreal Engineering Co., 164 St. James Street, Montreal, is engineer, in charge.

The International Fibre Board Co., whose plant at Penetanguishene, Ont., was destroyed by fire a short time ago, will erect a new factory at Midland, Ont.

The Chatham Malleable & Steel Mfg. Co., Chatham, Ont., manufacturer of stable fixtures, wagons, etc., is building an addition and will require equipment.

The Belanger Foundry Co., 1165 Carriere Street, Montreal, will purchase furnaces, melting pots, etc. J. Lamarre is manager.

The American La France Engine Co. of Canada, 195 Weston Road, Toronto, proposes to build an addition to its plant for the manufacture of motor trucks, etc.

The Mildmay Electric Co., Mildmay, Ont., will improve its electric lighting system and will purchase transformers, etc.

Toupin & Roi, 502 St. Catharine Street East, Montreal, will build an electric plant at St. Michael Des Saints, Que.

The Algonquin Power Co., Montreal, contemplates a water power development plant on the River Du Loup en Haute, near St. Paulin, Que., to cost $100,000. J. M. Robertson, Ltd., 20 St. Nicholas Street, Montreal, is engineer.

The Nova Scotia Power Commission, Tidewater, N. S., has signed a contract with the Albany Perforated Wrapping Co., Albany, N. Y., to furnish 4600 hp. electric energy to that company at West River, Sheet Harbor. To give this service the Nova Scotia Power Commission will erect a second generating station on East River with an ultimate capacity of 9000 hp.

Fire at the plant of the Canadian Iron Foundries, Ltd., Fort William, Ont., Nov. 29, damaged the cupola and furnace room to the extent of $10,000. The wheel-casting

brake-shoe and gray iron departments will be unable to operate for about a month. Reconstruction will start at once.

Western Canada

The West Kootenay Power & Light Co., a subsidiary of the Consolidated Mining & Smelting Co., is doubling the capacity of its power development plant at Bonnington Falls, Nelson, B. C.

The mill of the United Shingle Co., Columbia Street, New Westminster, B. C., owned by J. A. McKerchar, 1050 Gilford Street, Vancouver, B. C., was destroyed by fire with a loss of $50,000. It will be rebuilt at once.

The Victoria Lumber Mfg. Co., Chemainus, B. C., is having plans prepared for the erection of a lumber mill to cost $60,000.

Pacific Coast

SAN FRANCISCO, Nov. 28.

A SITE has been purchased at Emeryville, Cal., by the Southern Aluminum Co., New Orleans, for a new plant to manufacture aluminum and other metal products, estimated to cost $85,000. W. C. Drolet, 485 Boulevard Way, Oakland, Cal., is Pacific Coast representative.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, is planning for a new power house at Commercial and Montgomery Streets, estimated to cost $500,000, with machinery.

The Monrovia Ice Co., Monrovia, Cal., will build a new ice-manufacturing plant and storage, estimated to cost $40,000. Hamm & Grant, Inc., 607 Ferguson Building, Los Angeles, is engineer and will handle the erection.

The Arizona Power Co., Phoenix, Ariz., is disposing of a bond issue of $400,000, a portion of the proceeds to be used for extensions and additional equipment.

The Interlocking Cement Tile Co., 82 Ninth Street, Oakland, Cal., has purchased property at Clement Street and Forty-fifth Avenue, for a new plant. E. L. Chase is superintendent.

The Walton Lumber Co., Lowell, Wash., has plans for a new veneer mill, 120 x 850 ft., to cost $500,000, including electric power and other machinery.

The Puget Sound Light & Power Co., Seattle, is arranging an extension program to cost about $6,000,000, of which approximately $5,000,000 will be used for a new generating plant with transmission system. A. W. Leonard is president.

The Southern Sierras Power Co., Riverside, Cal., has acquired the property of the Holton Power Co., in the Imperial Valley. Plans are under consideration for extensions to cost $500,000, including additional transmission lines. F. O. Dolson is vice-president.

The Truscon Steel Co., Youngstown, Ohio, is planning for new branch works at Portland, Ore., for fabricating and other service. It will be one-story, 120 x 132 ft.

The Crown-Willamette Paper Co., Pittock Building, Portland, Ore., has plans for a new pulp and paper mill at Youngs River Falls, near Astoria, Ore., estimated to cost $350,000, with machinery. The installation will include a power house.

The Mackall-Paine Veneer Co., Vancouver, Wash., is planning the construction of a $50,000 power house.

Schiefer & Sons, Inc., San Diego, Cal., manufacturer of furniture, has purchased property at National City for a new one-story factory, 115 x 200 ft., with machine shop and power house, estimated to cost $100,000 including machinery.

C. T. Bolfing, Gilroy, Cal., former secretary of the local Chamber of Commerce, has plans for a new factory near the city limits to manufacture vitrified brick, etc., estimated to cost $30,000. The machinery will be electrically-operated.

The Northwest Copper & Sheet Metal Works, Inc., Portland, Ore., recently organized, has plans for a new one-story works, 100 x 100 ft. Louis E. Schmit, 410 Chamber of Commerce Building, represents the company, which is headed by Adolph Groeger. Edmund Bergholtz, Spalding Building, is architect.

The General Electric Co. has purchased at Los Angeles, Cal., five acres on the southwest corner of Santa Fe Avenue, and Fifty-second Street. A two-story reinforced concrete building on the property will be modified and converted into a service shop in which all kinds of electrical apparatus will be rebuilt and repaired. Later a large warehouse will be erected and eventually a factory.

The San Diego Smelter Co., abandoning its proposed location at Chula Vista, has closed for a 60-acre tract at San Ysidro, one mile from the Mexican border. Work on a group of buildings has been started and the company will expend $300,000 on its plant at once.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	41½	43½	Jones & Laugh'n.	108½	108½
Allis-Chal. pf. ..	91½	92	Lima Loco.	64⅞	67
Am. B.S. & F. pf.	103½	103½	Midvale Steel ..	28¼	29⅛
Am. Can	100⅛	105	Nat.-Acme	9¾	10¼
Am. Can pf.....	109	109¾	Nat. En. & Stm.	39⅞	42
Am. Car & Fdy.	160¾	162	N. Y. Air Brake.	41	42¾
Am. Locomotive.	73⅛	75	Nova Scotia Stl..	14½	14⅞
Am. Loco. pf...	117	117¼	Otis Steel	9¼	10⅛
Am. Radiator ..	84⅛	85⅛	Otis Steel pf....	55½	58
Am. Roll. Mill pf.	98⅝	99	Pressed Stl. Car.	53½	56
Am. Steel Fdries.	38¼	39	Pressed Steel pf.	83¼	84½
Am. Stl. Fd. pf..	101⅝	101¾	Replogle Steel ..	12	14
Bald. Loco.	124¼	129⅞	Republic	48½	50⅞
Beth. Steel	52	55⅝	Republic pf.	92⅛	93
Beth. Stl. 7% pf.	92½	93¼	Sloss-Sheffield ..	52½	55
Beth. Stl. 8% pf.	105¼	105¼	Sloss-Sheffi'd pf..	80¾	80¾
Br. Em. Steel...	4¼	4¼	Steel of Canada.	72¼	74⅛
Br. Em. Stl. 2 pf.	13¼	14	Superior Steel ..	30½	31½
Chic. Pneu. Tool	83⅞	85½	Transue-Wms. ..	33	33
Colo. Fuel	23	25¼	Un. Alloy Steel..	31	31½
Crucible Steel ..	64¾	67½	U. S. Pipe.....	49½	50⅞
Crucible Stl. pf..	90¾	90¾	U. S. Pipe pf...	84	87
Deere pf.	61¾	61¾	U. S. Steel.....	94¼	96½
Gen. Electric ...	181	182¼	U. S. Steel pf...	118¾	119
Gt. No. Ore Cert.	32	33⅜	Vanadium Steel.	30½	32¾
Gulf States Steel	81	85¼	Va. I., C. & Coke	52	52
Inland	38½	39¼	W'house Air Br.	82¾	85
Int. Har.	77	77⅞	Y'gstown S. & T.	67	69

Declares Christmas Dividend

The Blaw-Knox Co., Pittsburgh, has declared an extra Christmas dividend of 2 per cent on its common stock, payable Dec. 24, to stock holders of record Dec. 14. This will make a total dividend disbursement on this stock for this year of 10 per cent. President A. C. Lehman reports that earnings for 1923 will be equal to about 28 per cent on the common stock after allowance for taxes and depreciation and the payment of the dividends on the preferred stock, of which a 7-per cent cumulative issue of $1,400,000 is outstanding at present. Outstanding common stock amounts to $3,750,000 (150,000 shares of a par value of $25). Indicated net earnings after taxes, depreciation and preferred dividend requirements for the year therefore are $1,050,000 or $7 per share, which would meet the stock dividend, at recent regular rate of 8 per cent for 3½ years.

Industrial Finances

The Wickwire Spencer Steel Corporation, including the American Wire Fabrics Corporation, reports net income of $699,504 for the nine months ended Sept. 30, 1923, equal to $9.10 per share on $7,681,700 of preferred stock outstanding, deduction having been made for depreciation, interest, etc. Dividends amounting to 18 per cent have accumulated on preferred stock. Sales over the period amounted to $21,938,425.

The third-quarter report of the American Rolling Mill Co., showed net sales amounting to $6,418,849, exclusive of the Ashland works, with cost of sales $5,143,288. Earnings applicable to interest, taxes and dividends for the third quarter totaled $1,022,501, equivalent to 14 per cent on the common stock after preferred dividends and interest on notes had been met. The company's sheet mills have been maintaining 100 per cent operation practically all through the year.

The Magee Realty Corporation, Taunton, Mass., has completed the financing of $575,000 7 per cent first mortgage twenty-year sinking fund bonds. The Magee Furnace Co., a close corporation, makes ranges, heaters, furnaces, boilers, etc. Several months ago, it acquired property and enlarged its foundry at about the same time placing this property under a separate corporation, the Realty company, which leases the property to the Magee Furnace Co. The latter is operating at capacity and has sufficient unfilled business on its books to insure continued operations well into 1924. Money derived from the sale of the above bonds will be used to pay for land acquired and to retire outstanding bank loans.

The Penn Seaboard Steel Corporation has paid off $1,439,000 7 per cent three year notes due Feb. 1, 1924, these representing 95 per cent of the issue. The other 5 per cent previously was paid off. The company is now clear of funded debt. On Aug. 31, last, it had current assets of $2,511,891 and current liabilities of $1,568,892.

Directors of the Superior Steel Co. have sent a letter to the stockholders in which plans are outlined for the sale of a block of unissued common stock to a syndicate for $30 a share. With the proceeds and with funds obtained by other financing, it is proposed to retire on Feb. 15, next, the company's outstanding preferred shares. A

meeting of the stockholders has been called for Dec. 11 at Richmond, Va., to act on the proposal.

Upon the recommendation of a committee of creditors, R. H. Long, Framingham, Mass., has employed Caswell & Wood, Boston, industrial engineers, to take charge of his companies for the purpose of conserving assets and accomplishing as prompt a liquidation of the indebtedness as circumstances permit. Companies involved are the R. H. Long Co., a holding company, R. H. Long Motors Co., automobile manufacturer, and R. H. Long Shoe Co. Of the three, the automobile company is by far the most important. It owns the largest Framingham plants as well as a Worcester, Mass., plant erected in 1922. Automobiles are manufactured under the trade name of Bay State.

For the year ending Sept. 30, the financial statement of the Canada Iron Foundries, Ltd., Montreal, Quebec, shows decided improvement with net earnings after all charges, including a 2 per cent dividend distribution on the preferred shares, shown at $51,761, equal to 3.2 per cent on the common stock outstanding. This compares with a deficit of $104,437 in 1922. Earnings stood at $348,518 as compared with $115,349 for last year. Commenting on the increased turnover during the year, the president points out that owing to competition from European companies enjoying the benefit of a low exchange, prices were low and much business had to be taken at a small margin of profit, as it was considered the best policy to keep in operation as fully as possible. Hence, while this enabled the company to keep costs down and left profits at the end of the year, such profits were not proportionate to the volume of business transacted.

The Paige-Detroit Motor Car Co., Detroit, is planning to increase its capital stock from $7,000,000 to $11,000,000.

The American Rolling Mill Co. reports net profits for the first nine months of 1923 of $3,008,460. After preferred and debenture stocks, there was a remainder equivalent to $2.46 per share on the $19,935,325 common stock of $25 per share.

Stockholders of the Hydraulic Steel Co., Cleveland, have been notified of the formation of a preferred stockholders' protective committee, consisting of Frederick W. Yates, New York, chairman; James A. Drain, Washington; Lyman Spitzer, Toledo; G. B. Johnson and R. A. Wilbur, Cleveland.

Plans of New Companies

The Essex Wire Cloth Co., New York, recently organized with $100,000 capital stock to manufacture expanded metal, wire cloth, etc., has secured property on Mill Street, Belleville, N. J., where operations are being planned. W. H. Bounce, A. Miller and H. B. Bunecke are the incorporators.

The Shoe Kleaner Services, Inc., 11 East Sixteenth Street, New York, has organized the Penny Shoe Kleaner of New Jersey to distribute and operate the machines manufactured by the former company. S. Grant is treasurer of the Shoe Kleaner Services, Inc.

The Collins Metal Corporation, New York, has been organized with capital of 1000 shares, no par value, to manufacture metal products. At first the company will deal in and eventually may manufacture on a small scale a product of limited demand. If manufacturing is undertaken it will be done in northern New York. Address care of W. S. Thomson, 36 West Forty-fourth Street.

Wallace P. Cohoe & Co., Inc., New York, has been organized to manufacture metal bottle caps. Incorporators are J. G. Schurman, B. F. Wilcox and Wallace P. Cohoe, 320 Broadway.

The Pan American Petroleum & Transport Co., 120 Broadway, New York, plans the organization of the Pan American Western Petroleum Co. with authorized capital of 1,500,000 shares of stock, no par value, held by the parent company and expected to net $10,500,000 to be used in the development of properties held in California. E. L. Doheny is chairman of directors.

The Standard Electric Incubator Co., Inc., 76 Greenwich Street, New York, recently organized, will manufacture electric incubators. Work is done by contract. J. T. Howey is general manager.

The Beacon Press Steel Co., Inc., 86 Page Street, Providence, R. I., recently organized, will manufacture light and medium pressed metal products. A safety device for power presses and high speed tapping machines is also made. George F. Cooper is president and treasurer.

The Alton File Co., Alton, Ill., recently organized with capital stock of $30,000, is now engaged in manufacturing files and rasps. M. D. Barker of Springfield, Ill., heads the company.

The Florin Foundry & Mfg. Co., Florin, Pa., has been incorporated with capital stock of $125,000, having purchased an eight-acre site, on which to build a plant. Foundry equipment will be installed. A. E. Koch, president Philadelphia Gas Range Co., Philadelphia, is one of the directors.

The Freeport Implement Co. has been organized by a syndicate of Freeport, Ill., to take over the business of the Stevenson Barn Equipment Co., Barton, Wis., which was organized in 1918 to manufacture steel stanchions.

The Harris-Luckett Hardware Co., San Angelo, Tex., has been organized with $60,000 capital stock to do a wholesale and retail business, covering the territory adjacent to San Angelo.

The New England Motors Corporation, Newport, R. I., has been organized with capital stock of $2,000,000 to manufacture automobiles. Its purpose is to build these with a new construction of motor, both 2- and 4-cycle combined. All work will be done in the company's plant. It is now in the market for materials. Roscoe F. Levens is president and general manager, and Edmund Baccari is secretary-treasurer.

The Inter-Southern Radio Corporation, Dallmeyer Building, Jefferson City, Mo., has been organized to manufacture electrical and radio equipment and parts. It is probable that manufacturing will be started in the early part of next year. The management is interested in obtaining information regarding material and equipment needed for these lines. Ernest L. Schneider is president and general manager.

The B. A. S. Co., Inc., Philadelphia, has been organized to invent, promote and develop commercial processes which will be turned over to subsidiary companies to be placed on a commercial basis. It is unlikely that the company itself will manufacture. Address care of Percy C. Madeira, Jr., Ballard, Spahr, Andrews & Madeira, 1035 Land Title Building, Philadelphia.

The Empire Miniature Lamp Corporation, care of Corn & Silverman, 20 Clinton Street, Newark, N. J., has been organized with $50,000 capital stock to manufacture electric lamps and kindred products. It has taken over the business formerly operated as the Empire Glass Bulb Co.

The Crouse & Pope Foundry Corporation, Auburn, N. Y., has been incorporated with capital stock of $100,000 to manufacture light and medium gray iron castings. It has taken over the No. 1 Gray Iron Foundry at Auburn, now being vacated by the International Harvester Co., together with a part of the equipment. The plant has a capacity of from 50 to 75 tons per day. William Crouse is president; William J. Henry, vice-president; Harry L. Pope, treasurer, and Earl G. Washburn, secretary.

The Auburn Metal Products, Auburn, Ind., was recently organized with capital stock of $15,000 to manufacture automobile parts for service and replacement work, having taken over plant and equipment of a company by the same name. P. A. Watson is president, E. E. Troops, vice-president and manager and L. R. Watson, treasurer. P. A. Watson will retain his position as factory manager for the Auburn Automobile Co.

The Atlantic Steel Castings Co., Chester, Pa., has been organized with capital of 35,000 shares, no par value, as a step in the reorganization of the Atlantic Steel Castings Co. of Pennsylvania. William A. Faison is one of the principals.

The Blair Strip Steel Co. has been financed at New Castle, Pa., with 1000 shares of preferred and a like amount of no par value stock, already subscribed, to manufacture cold rolled steel products. Definite plans are unknown but it is understood that a new plant will be made ready for operation next summer.

The Boyer Mfg. Co., 793 Military Avenue, Detroit, has been organized with $50,000 capital stock to manufacture electric appliances, specializing in an electric motor driven brush vacuum cleaner. The company has factory and equipment and is in production. S. J. Boyer is president.

C. G. Mahey, secretary-treasurer W. J. Early Sons Foundry Corporation, organized a short time ago to do a foundry business in the Pittsburgh district, states that building will not be undertaken before next spring. John N. Early is president and Lee H. Marshall, vice-president of the company. Headquarters are at 804 Sarah Street, S. S., Pittsburgh.

The Peerless Products Co., 42 Lawrence Street, Newark, N. J., recently organized, will manufacture automobile and exhaust whistles. Considerable amounts of sheet brass, brass tubing and castings, aluminum and malleable iron castings, bolts and nuts are required. It has a foundry at Kearny, N. J. Howard Schaarz is head.

The Oilheat Corporation, 39 Milwaukee Avenue West, Detroit, has been organized to act as distributor for the Oliver Oil Gas Burner Co. of St. Louis. J. W. Keenan heads the company.

The Rapid Heater Co., Grand Rapids, Mich., has been organized to manufacture several types of gas water heaters, having purchased the plant of the old Rapid Heater Co. Equipment is nearly complete, but the company will add a few machines. E. M. Newman is general manager.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	4.10c.
Toe-calk, ½ x ⅜ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c. to 4.65c.
Squares, flats and hex	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.20c. to 4.34c.
No. 12	4.25c. to 4.39c.
No. 14	4.30c. to 4.44c.
No. 16	4.40c. to 4.54c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.70c.	.....
Nos. 22 and 24	4.35c. to 4.85c.	5.10c.
No. 26	4.40c. to 4.90c.	5.15c.
No. 28	4.50c. to 5.00c.	5.25c.
No. 30	4.70c. to 5.20c.	.....

No. 28 and lighter, 36 in. wide, 20c. higher.

Galvanized

	Per Lb.
No. 14	4.60c. to 5.10c.
No. 16	4.75c. to 5.25c.
Nos. 18 and 20	4.90c. to 5.40c.
Nos. 22 and 24	5.05c. to 5.55c.
No. 26	5.20c. to 5.70c.
No. 27	5.35c. to 5.85c.
No. 28	5.50c. to 6.00c.
No. 30	5.95c. to 6.45c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt	—41	—24	⅛ in. Butt	— 4	+19
¼ in. Butt	—46	—32	¼ in. Butt	—11	+ 9
1-3 in. Butt	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap	— 5	+14
7-8 in. Lap	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap	—34	— 6	7-12 in. Lap	— 3	+16

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¾c. to 18¾c.
High brass wire	18¼c. to 19¼c.
Brass rods	15½c. to 16½c.
Brass tube, brazed	25¾c. to 27¼c.
Brass tube, seamless	22 c. to 23 c.
Copper tube, seamless	23½c. to 24½c.

Copper Sheets

Sheet copper, hot rolled, 21c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20	
			Prime / Seconds
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb.	$6.55 / $6.30
		90 lb.	6.65 / 6.40
		100 lb.	6.75 / 6.50
IC. $12.55	$10.70	IC.	7.00 / 6.75
IX. 13.95	12.55	IX.	8.25 / 8.00
IXX. 15.55	13.75	IXX.	9.50 / 9.25
IXXX. 17.10	15.30	IXXX.	10.75 / 10.50
IXXXX. 18.85	16.80	IXXXX.	12.00 / 10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	47c.
Bar	55c. to 60c.

Copper

Lake ingot	15¾c.
Electrolytic	15¼c.
Casting	14¼c.

Spelter and Sheet Zinc

Western spelter	7¾c.
Sheet zinc, No. 9 base, casks	10½c. open 11c.

Lead and Solder*

American pig lead	8c. to 8½c.
Bar lead	10c. to 12c.
Solder ½ and ½ guaranteed	34¾c.
No. 1 solder	32¾c.
Refined solder	28¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	11c. to 12c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	36c.

Old Metals

The market is dull and business very quiet. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	10.75
Copper, heavy wire	10.25
Copper, light bottoms	8.75
Brass, heavy	5.75
Brass, light	5.00
Heavy machine composition	8.75
No. 1 yellow brass turnings	6.00
No. 1 red brass or composition turnings	7.75
Lead, heavy	6.00
Lead, tea	5.00
Zinc	4.00
Cast aluminum	15.25
Sheet aluminum	15.25